SUZUKI

SERVICE MANUAL

TS100 TC100

FOREWORD

This service manual explains the construction and operation of the Suzuki TS100, TC100 motorcycles and includes instructions for inspecting and adjustments and the proper procedure for making repairs when they are needed.

Proper use of this manual by the mechanic will result in a saving of time, avoidance of unnecessary work and better maintenance of the motorcycle.

It can be said that the repairs are nearly completed when the trouble is pin-pointed accurately.

A list of the most common troubles and their causes is included in this service manual. This manual is a compilation of the experience and recommendations of Suzuki designers, engineers, factory personnel and motorcycle dealers who have been servicing this model for some time.

For convenience, this manual is divided into several sections.

It is better if the mechanic reads the entire section first before beginning work in order to avoid unnecessary disassembly, labor, etc.

The metric system of measurements is used in the Suzuki factory, and metric measurements are used in this manual.

For the convenience of users overseas who may not be familiar with the metric system however, measurements in inches, etc., are included in brackets ( ). If there is any question about measurements, rely on the metric measurements as being absolutely correct.

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1. RIGHT AND LEFT SIDE VIEWS

TS100

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Fig. 1–2

TC100

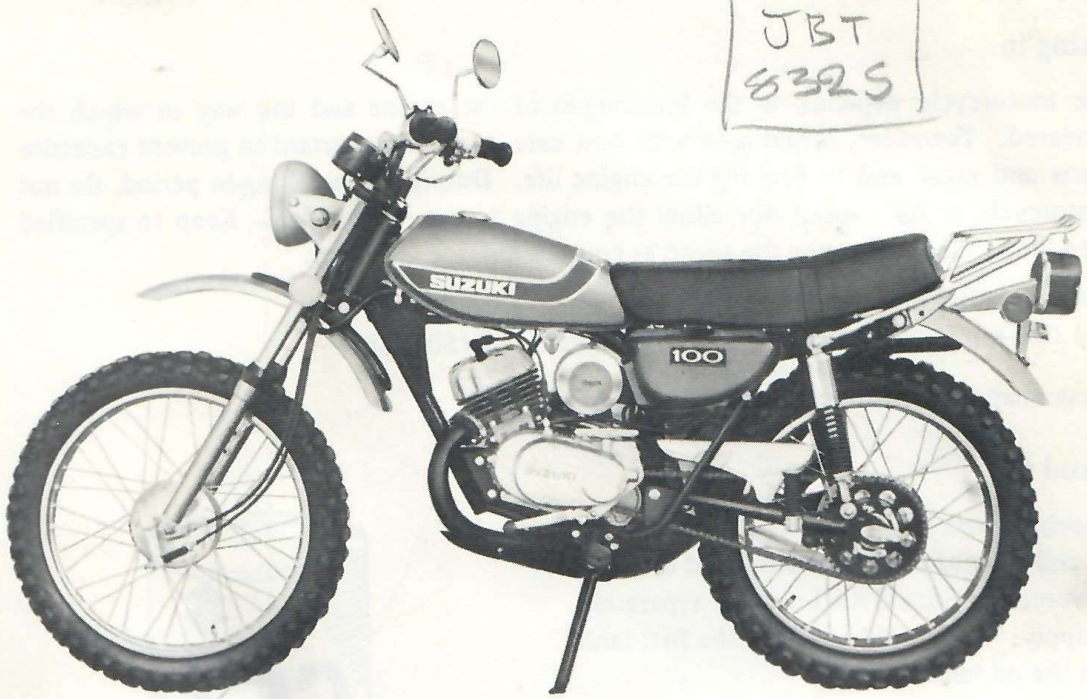


Fig. 1–3

Fig. 1–4

2. GENERAL INSTRUCTION

To keep the motorcycle in peak condition, advise your customers to follow these instructions and this will give top performance at all times.

2–1. Breaking-in

The life of the motorcycle depends on the breaking-in of the engine and the way in which the motorcycle is treated. Therefore, breaking-in with best care is much important to prevent excessive wear of the parts and noise and to prolong the engine life. During the breaking-in period, do not operate the motorcycle at high speed nor allow the engine to run wide open. Keep to specified breaking-in speed limit. Gradually raise the speed as covered mileage increases.

First 800 km (500 miles) . . . . . below 60 kph (40 mph)
Up to 1,600 km (1,000 miles) . . . . . below 80 kph (50 mph)

And it is not recommendable to force it to climb a steep hill.

2–2. Fuel and Oil

The engine's moving parts such as crankshaft bearings, con-rod, piston and cylinder wall are lubricated by fresh oil pressure-delivered by Suzuki CCI system separately from the fuel supply. Put gasoline only in the fuel tank and engine oil in the oil tank.

Fuel . . . . . gasoline of 85 – 95 octane in Research Method
Engine Oil . . . Suzuki CCI Oil

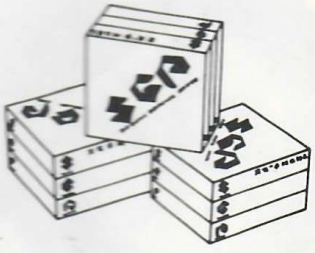
* If Suzuki CCI Oil is not available, non-diluent (non-self mixing type) two stroke oil with around SAE No. 30 may be used instead.

Transmission Oil . . . . . Suzuki Transmission Oil 700 cc (1.5/1.2 pt, US/Imp)
Change first 1,000 km (750 mi) and 3,000 km (2,000 mi) thereafter.

* If Suzuki Transmission Oil is not available, motor oil of SAE 20W/40 may be used instead.

2–3. Genuine Parts

When replacing parts, always use Suzuki genuine parts, which are precision made under severe quality control. If imitation parts (not genuine parts) are used, good performance cannot be expected from the motorcycle and in the worst case, they may cause a breakdown.

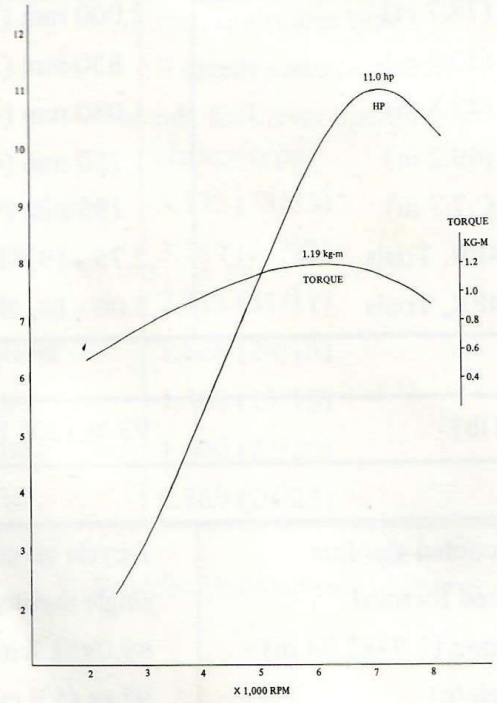


2–4. Periodical Inspection

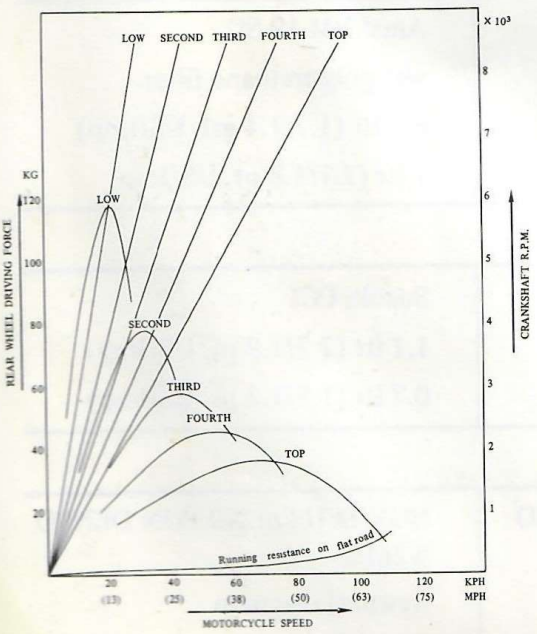
To prolong the life of the motorcycle and avoid unforeseen occurrance of serious troubles, the periodical inspection is indispensable. Be sure to check the motorcycle periodically according to the list given at the end of this manual.

3. PERFORMANCE CURVES

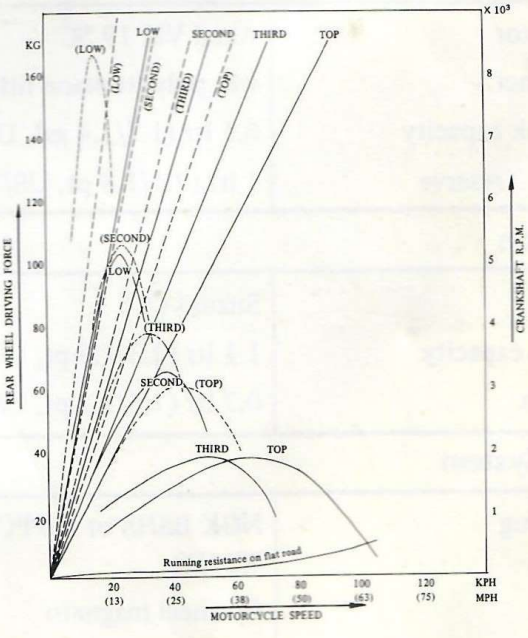
TS100/TC100 ENGINE PERFORMANCE CURVES



TS100 MOTORCYCLE PERFORMANCE CURVES



TC100 MOTORCYCLE PERFORMANCE CURVES



4. SPECIFICATIONS

Model Name	TS100	TC100
Dimensions		
Overall length	2,000 mm (78.7 in)	2,000 mm (78.7 in)
Overall width	830 mm (32.7 in)	830 mm (32.7 in)
Overall height	1,080 mm (42.5 in)	1,080 mm (42.5 in)
Wheel base	1,250 mm (49.2 in)	1,250 mm (49.2 in)
Road clearance	195 mm (7.7 in)	195 mm (7.7 in)
Tires, front	2.75 - 19, 4PR, Trials	2.75 - 19, 4PR, Full knobby
rear	2.75 - 18, 4PR, Trials	3.00 - 18, 4PR, Full knobby
Weight		
Dry weight	92 kg (202 lb)	93 kg (205 lb)
Engine		
Type	2-cycle air cooled gasoline	2-cycle air cooled gasoline
Cylinder	single inclined forward	single inclined forward
Bore x Stroke	49.0x51.8 mm (1.93x2.04 in)	49.0x51.8 mm (1.93x2.04 in)
Piston displacement	97 cc (5.9 cu-in)	97 cc (5.9 cu-in)
Corrected compression ratio	6.5 : 1	6.5 : 1
Maximum horse power	11 hp/7,000 rpm	11 hp/7,000 rpm
Maximum torque	1.19 kg-m (8.6 lb-ft)/6,000 rpm	1.19 kg-m (8.6 lb-ft)/6,000 rpm
Starter	Kick	Kick
Fuel System		
Carburetor	Amal VM 19 SC	Amal VM 19 SC
Air cleaner	wet polyurethane filter	wet polyurethane filter
Fuel tank capacity	6.5 ltr (1.7/1.4 gal, US/Imp)	6.5 ltr (1.7/1.4 gal, US/Imp)
reserve	1 ltr (2.1/1.8 pt, US/Imp)	1 ltr (2.1/1.8 pt, US/Imp)
Lubrication		
Engine	Suzuki CCI	Suzuki CCI
Oil tank capacity	1.1 ltr (2.3/1.9 pt, US/Imp)	1.1 ltr (2.3/1.9 pt, US/Imp)
Gear box	0.7 ltr (1.5/1.2 pt, US/Imp)	0.7 ltr (1.5/1.2 pt, US/Imp)
Ignition System		
Spark plug	NGK B8HS or NIPPON DENSO W24FS	NGK B8HS or NIPPON DENSO W24FS
Ignition	flywheel magneto	flywheel magneto
Ignition timing	20° BTDC 2.22 mm	20° BTDC 2.22 mm

Model Name		TS100	TC100
Transmission System			
Clutch		wet, multi disc type	wet, multi disc type
Speeds		5 speeds constant mesh	4 x 2 speeds constant mesh
Gear shifting		left foot lever operated return change type	left foot lever operated return change type
Primary reduction ratio		3.173 (73/23)	3.173 (73/23)
Final reduction ratio		3.769 (49/13)	3.615 (47/13)
Gear ratios	low	2.818 (31/11)	2.583 (31/12) 4.195
	second	1.866 (28/15)	1.642 (23/14) 2.667
	third	1.388 (25/18)	1.210 (23/19) 1.965
	fourth	1.100 (22/20)	0.947 (18/19) 1.538
	fifth	0.869 (20/23)	

* Specifications subject to change without notice.

5. REVOLUTIONARY "SUZUKI C.C.I."

Of the various lubrication systems for two-stroke engine, Suzuki C.C.I. developed by Suzuki Motor Co., Ltd. the world leading producer of two-stroke engines, is not only the newest but is quite the best by a large margin.
C.C.I. system supplies the correct amount of oil under pressure directly to the stressed points which need lubrication. This is the most advanced lubrication system in the world, because fresh oil, not old oil deteriorated after a long use as often seen in four-stroke engines, is always supplied directly to the specific engine parts needing lubrication rather than to the carburetor or cylinder inlet stub either of which systems will have oil's lubricating performance as the oil is thinned by gasoline.

Explanation of mechanism

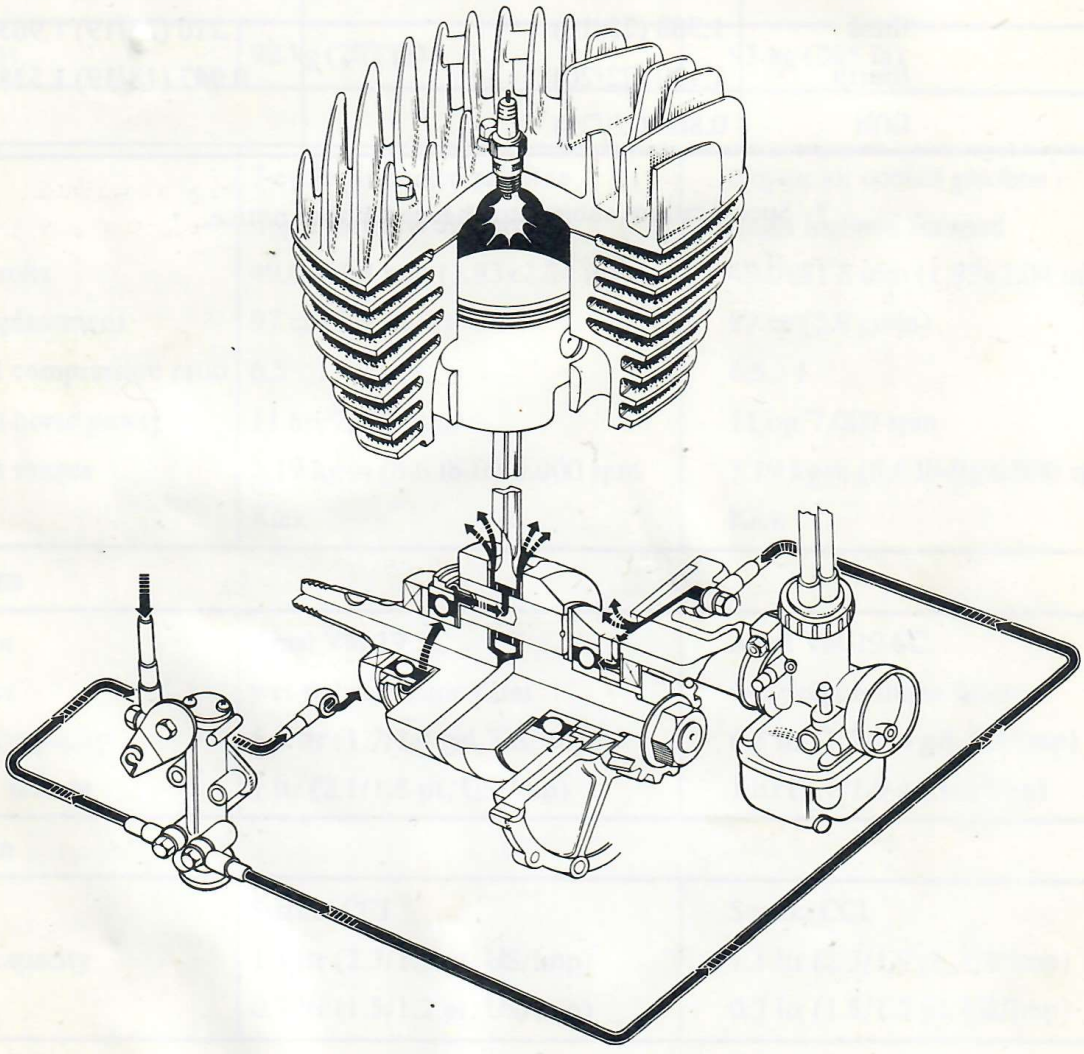


Fig. 5–1 Explanation of mechanism

Lubrication oil is supplied under pressure through two oil pipes by an oil pump and is completely separate from the gasoline supply.
Each oil pipe is separated into two at a junction, one of which leads to the crankshaft, and lubricates the crankshaft side bearing. After lubricating it, the oil passes through a passage in the crankpin and lubricates the needle roller bearing in the connecting rod big end. The oil is then sprayed into the crankcase by centrifugal force. The other oil channel supplies oil to the cylinder and lubricates the cylinder wall.
A part of the oil from this channel combines with oil sprayed from the connecting rod big end by centrifugal force and lubricates the con-rod small end needle roller bearing, piston and cylinder wall.
The total amount of oil pumped is regulated by the oil pump control lever operated by the oil pump control cable, which is synchronized with the throttle cable and varies with the throttle opening. At the same time, the amount of oil supplied is also controlled by the engine speed thus the correct amount of oil, exactly the amount needed by the engine, is always supplied. C.C.I. system is the most ideal lubrication system for the two-stroke engine.

Features of Suzuki C.C.I.

1. Mixing of gasoline and oil is eliminated.
2. Pure, fresh oil is supplied directly to the engine so lubrication efficiency is excellent.
3. The amount of oil supplied is strictly in accordance with the engine needs, so it is economical.
4. "Two-stroke" exhaust smoke is eliminated.
5. Carbon accumulation is small.
6. The motorcycle is not dirtied with oil.

6. SPECIAL TOOLS

Special tools listed below are used to disassemble, assemble and to perform maintenance and service. These special tools make works easy which cannot be done simply with ordinary tools and prevent the parts from damage. It is recommended to provide these special tools as shop equipment.

Ref. No.	Tool No.	Tool Name	Use for
1	09910–20111	Piston holder	Locking crankshaft
2	09910–80112	Crankcase separating tool	Separating crankcase
3	09913–50110	Oil seal remover	Removal of oil seals
4	09913–70122	Bearing & oil seal installing tool	Installation of bearings & oil seals
5	09913–80110	Bearing & oil seal installing tool	Installation of bearings & oil seals
6	09920–20310	Clutch spring hook	Removal or Installation of clutch spring pin
7	09920–52310	Clutch sleeve hub holder	Locking clutch sleeve hub
8	09920–60310	Clutch sleeve hub holder handle	Locking clutch sleeve hub
9	09920–70111	Snap ring opener	Removal or Installation of snap rings
10	09930–10111	Spark plug wrench	Removal or Installation of spark plug
11	09930–20111	Point wrench with 0.35 mm gauge	Adjustment of contact point
12	09930–30113	Rotor remover	Removal of flywheel rotor
13	09930–40113	Engine sprocket & flywheel holder	Locking engine sprocket or flywheel
14	09931–00111	Timing gauge	Checking ignition timing
15	09940–10122	Steering stem lock nut wrench	Tightening or loosening steering stem nut or front fork lower tube
16	09940–60112	Spoke nipple wrench	Adjustment of spoke tension
17	09900–09002	Shock driver	Loosening or tightening cross-head screw
18	09900–25001	Pocket tester	Checking electrical equipments
19	09900–27002	Timing tester	Adjustment of ignition timing

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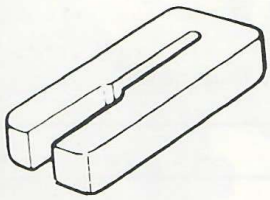
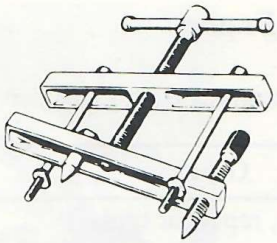
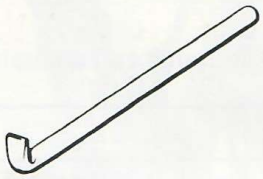
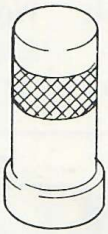

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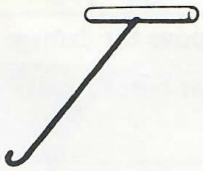
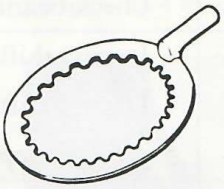
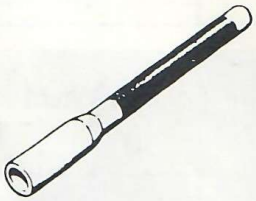

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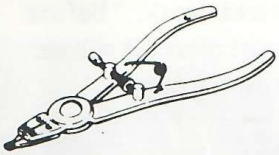
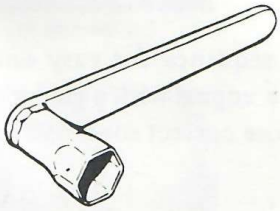
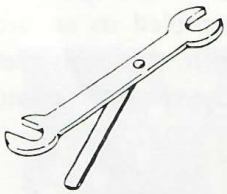
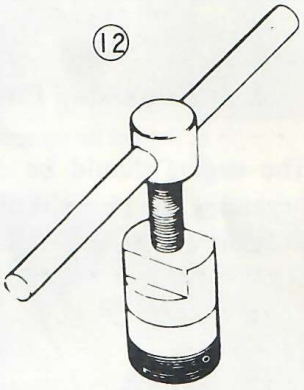

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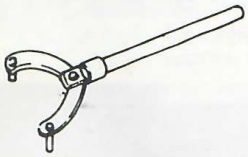
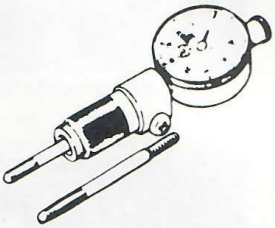
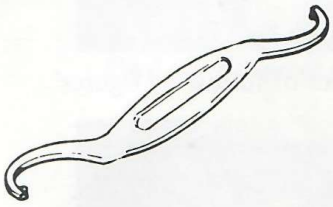
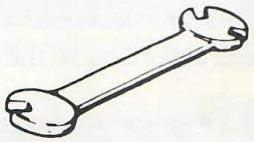

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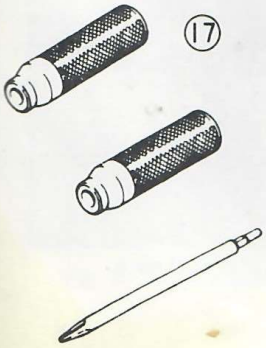
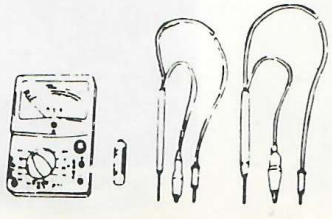
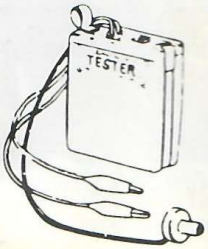




7. ENGINE

7–1. Work With Engine Dismounted From Frame

Remove the engine from the frame and separate the crankcase into two halves for these jobs.

	Part	Operation
1	Crankshaft	Inspect for shake, repair or replace Check bearing for wear, replace Check oil seals for leaking, replace
2	Transmission System	Check gears and shakes, adjust or replace Check bearings and bushings, replace
3	Gear System	Inspect shifting cam groove for damage, replace Inspect shifting forks for burned spots and wear, repair or replace
4	Kick Starter System	Inspect drive gear for worn ratchet, replace Inspect pawl and pawl spring for wear and tension, replace

7–2. Removing Engine From Frame

The engine should be disassembled in an orderly sequence for easy and efficient work. Before beginning the removal operation, throughly clean the engine with a steam cleaner or cleaning solvent to remove road dirt. Always use clean tools, and choose correct tools to avoid damaging parts.

Work according to the order of following figures.

Fig. 7–2–1 Directing fuel cock lever to "STOP" position

Fig. 7–2–2 Pulling fuel line from fuel cock

Fig. 7–2–3 Removing spark plug cap from spark plug

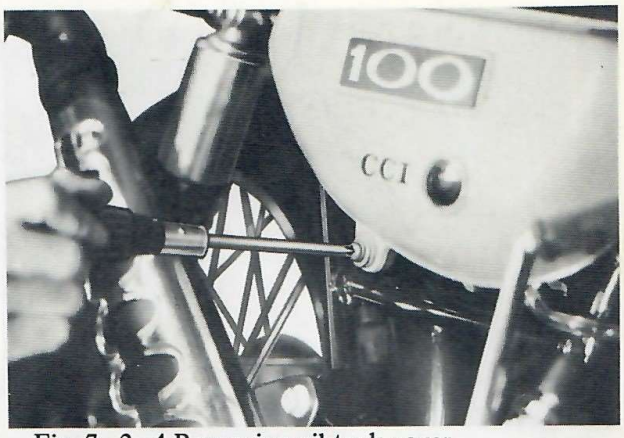


Fig. 7–2–4 Removing oil tank cover

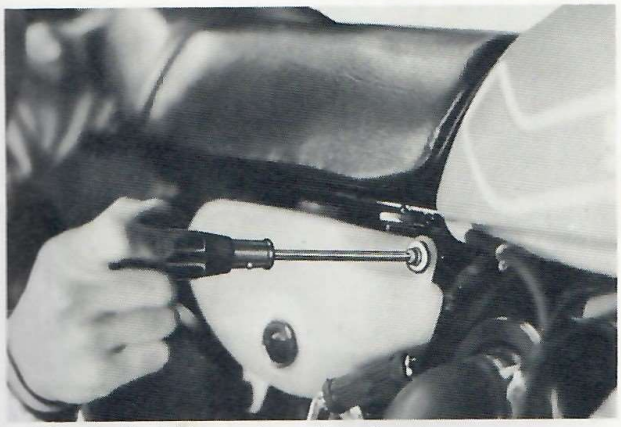


Fig. 7–2–5 Removing oil tank set screws

Fig. 7–2–6 Disconnecting oil line

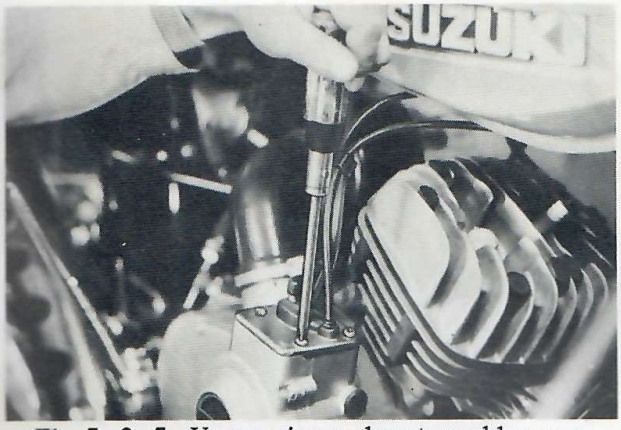


Fig. 7–2–7 Unscrewing carburetor rubber cap screws

Fig. 7–2–8 Slipping up carburetor rubber cap

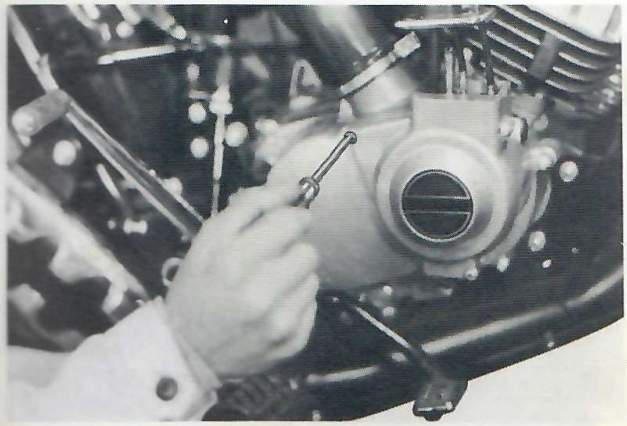


Fig. 7–2–9 Unscrewing carburetor cover screws

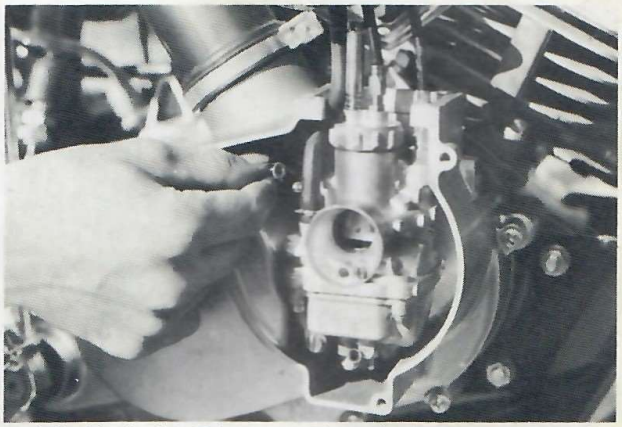


Fig. 7–2–10 Disconnecting fuel line vacuum tube and over flow pipe

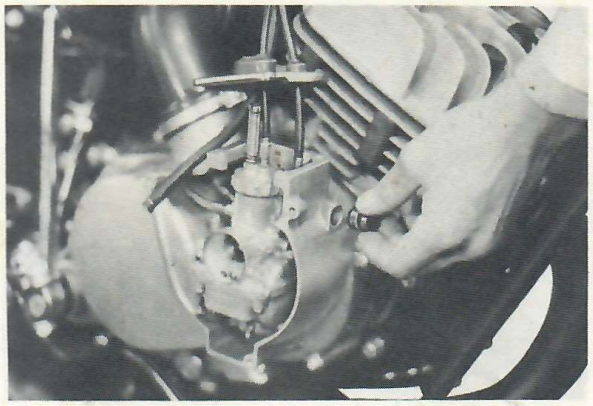


Fig. 7–2–11 Removing carburetor fitting hole plug

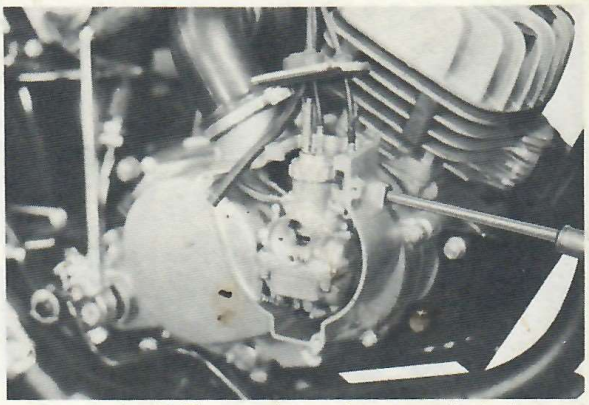


Fig. 7–2–12 Unscrewing carburetor clip bolt

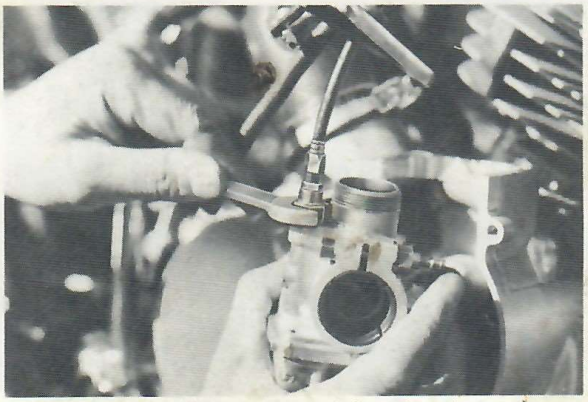


Fig. 7–2–13 Unscrewing mixing chamber cap

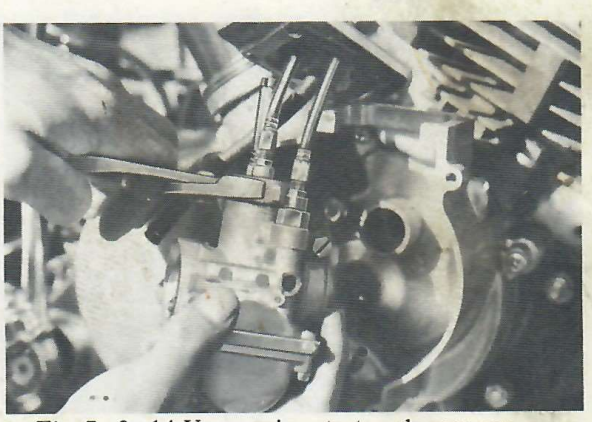


Fig. 7–2–14 Unscrewing starter plunger cap

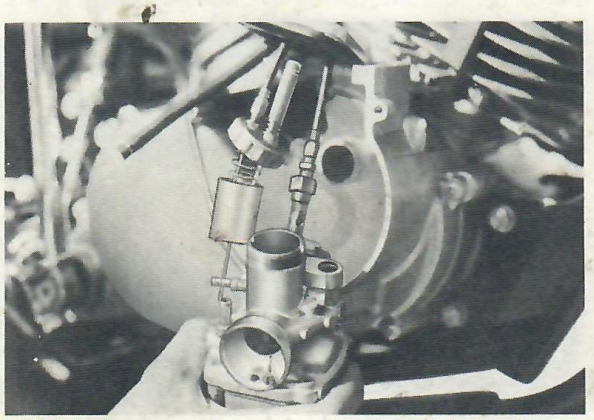


Fig. 7–2–15 Removing carburetor from engine

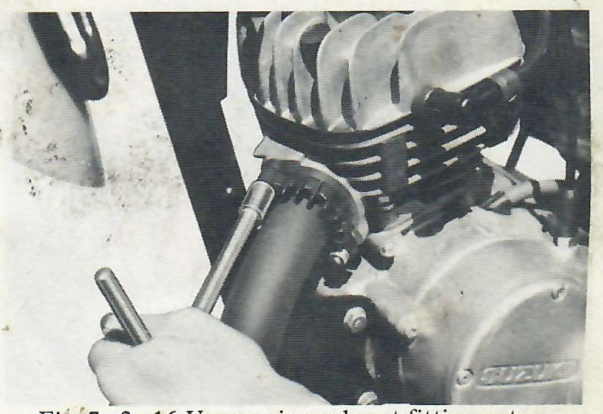


Fig. 7–2–16 Unscrewing exhaust fitting nuts

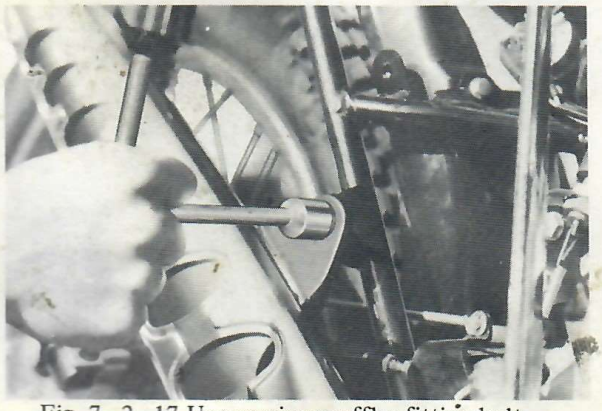


Fig. 7–2–17 Unscrewing muffler fitting bolt

Fig. 7–2–18 Taking off frame left cover

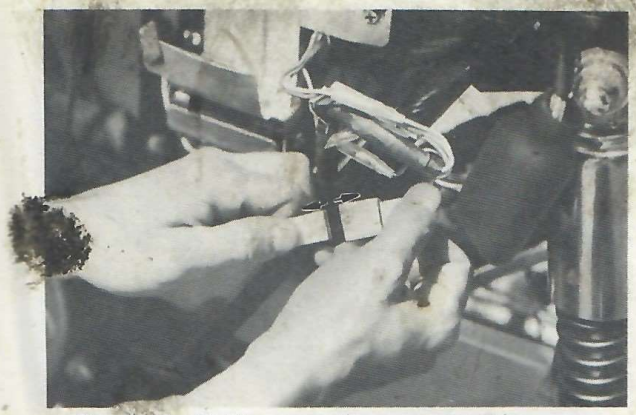


Fig. 7–2–19 Disconnecting magneto wire

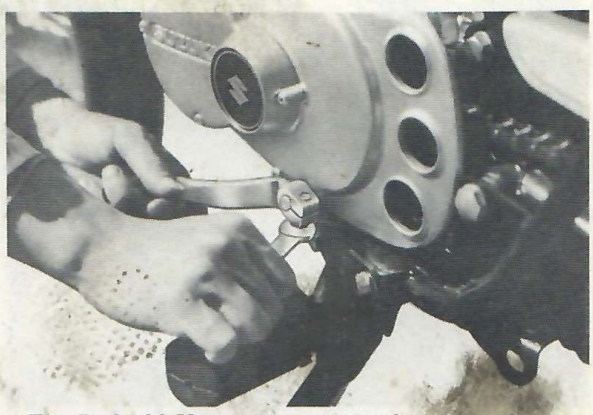


Fig. 7–2–20 Unscrewing gear shifting lever fitting bolt

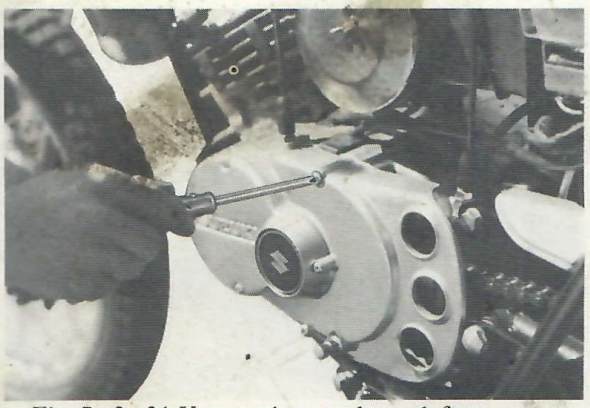


Fig. 7–2–21 Unscrewing crankcase left cover screws

Fig. 7–2–22 Disconnecting drive chain

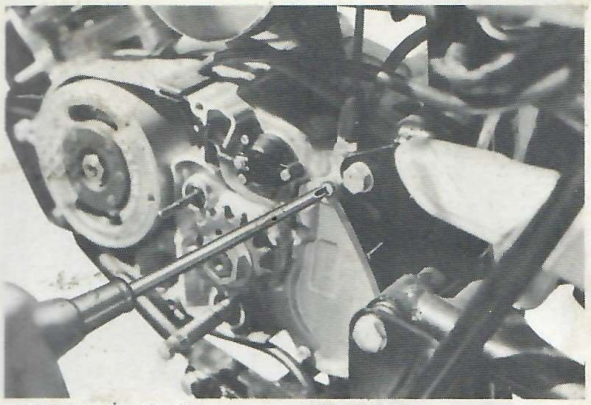


Fig. 7–2–23 Unscrewing oil pump cover screws

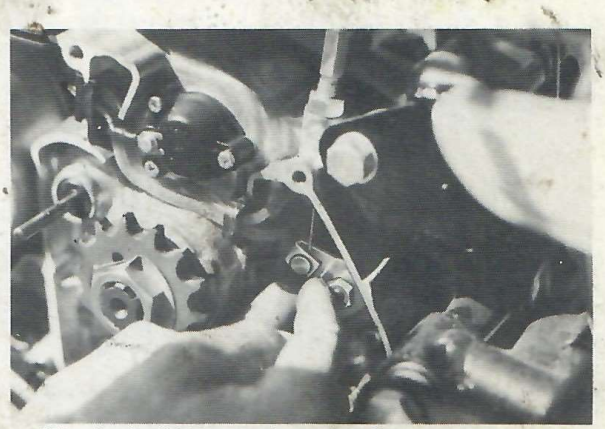


Fig. 7–2–24 Removing cable from oil pump control lever

Fig. 7–2–25 Unscrewing air cleaner fitting screws

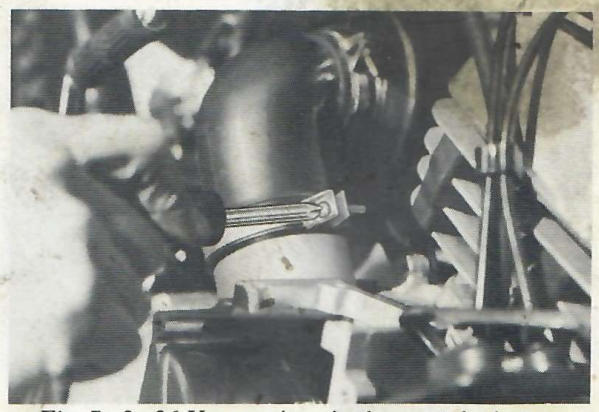


Fig. 7–2–26 Unscrewing air cleaner tube lower clamp

Fig. 7–2–27 Unscrewing engine mounting bolts

Fig. 7–2–28 Removing engine from frame

7–3. Tips on Disassembling Engine

The engine is the heart of the motorcycle and consists of precisely manufactured parts, which must be handled and assembled most carefully. When working on the engine, keep your hands and tools clean at all times.
Before beginning work, prepare work benches, necessary tools, clean rags and cleaning solvent for washing parts.

Disassemble the engine according to the following figures.

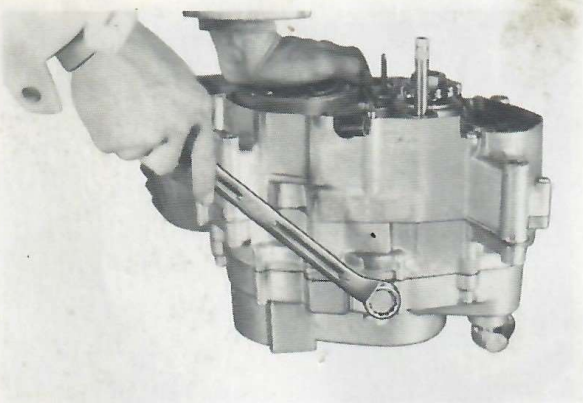


Fig. 7–3–1 Loosening drain plug with 21 mm wrench

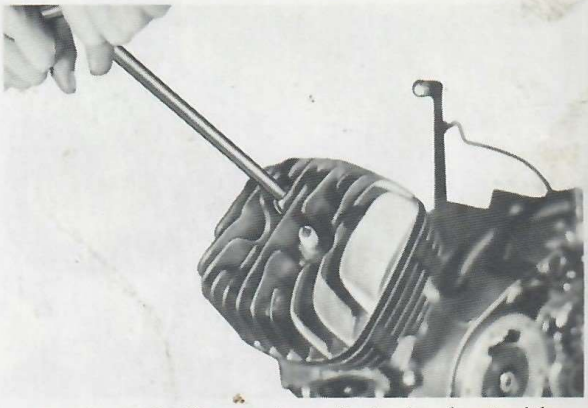


Fig. 7–3–2 Unscrewing cylinder head nut with 14 mm wrench

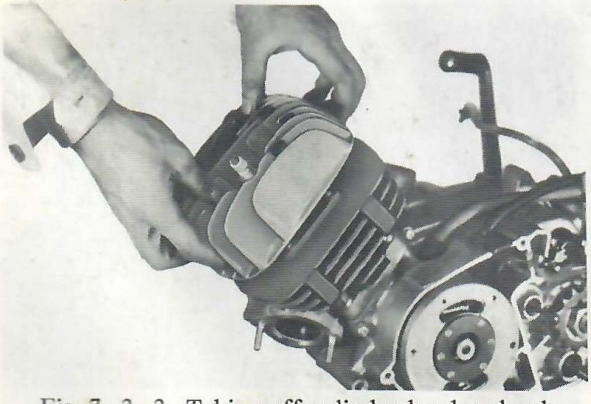


Fig. 7–3–3 Taking off cylinder head and cylinder head gasket

Fig. 7–3–4 Taking off cylinder

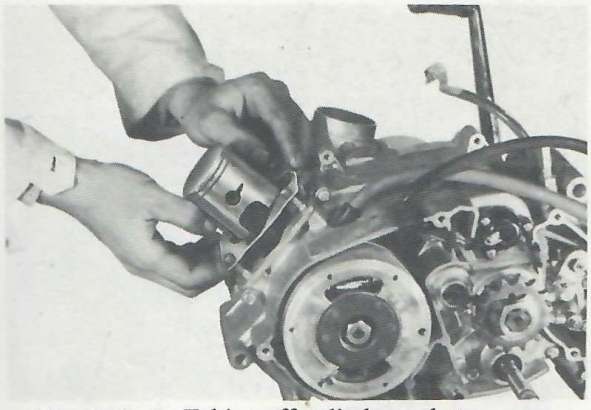


Fig. 7–3–5 Taking off cylinder gasket

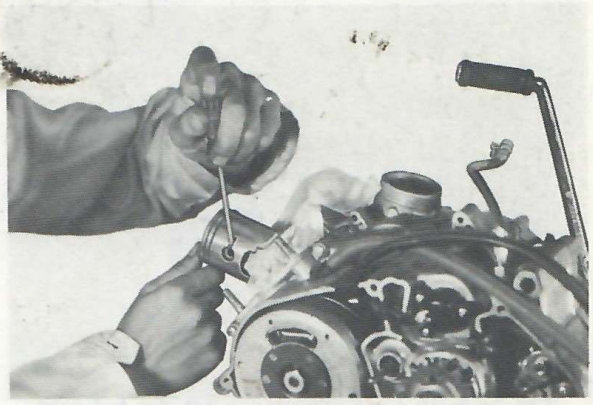


Fig. 7–3–6 Removing piston pin circlip

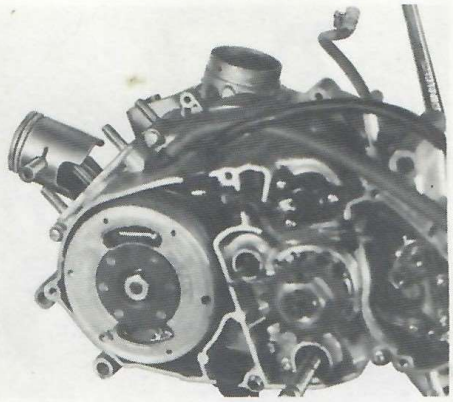


Fig. 7–3–7 Removing piston pin

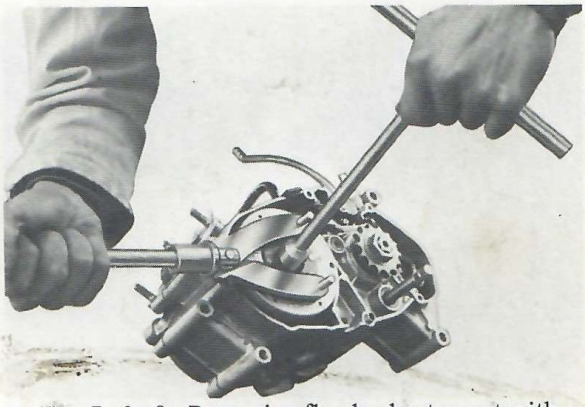


Fig. 7–3–8 Removing flywheel rotor nut with 17 mm wrench and engine sprocket & flywheel holder (special tool No. 09930–40113)

Fig. 7–3–9 Loosening flywheel rotor with rotor remover (09930–30113) and engine sprocket & flywheel holder (09930–40113)

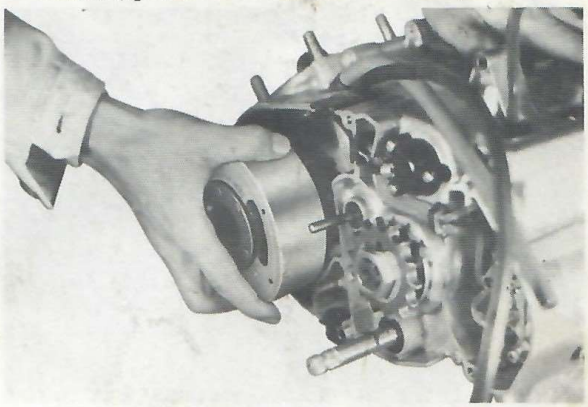


Fig. 7–3–10 Removing flywheel rotor

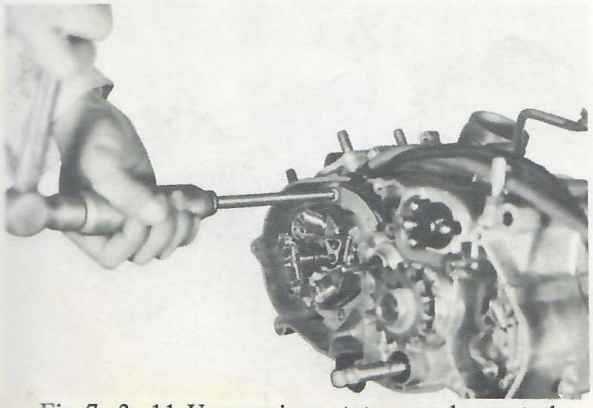


Fig. 7–3–11 Unscrewing stator and neutral switch wire fitting screws with cross head screw driver

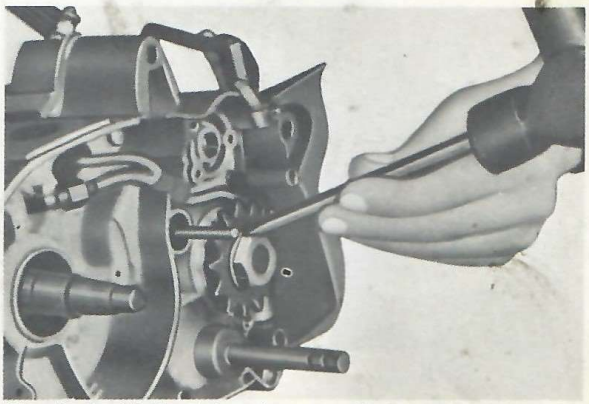


Fig. 7–3–12 Straightening sprocket washer with chisel and hammer

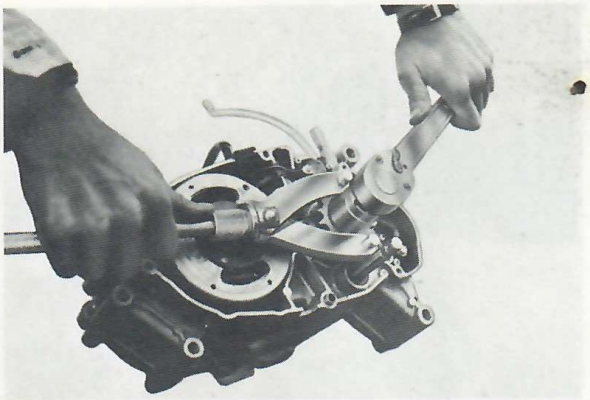


Fig. 7–3–13 Unscrewing sprocket set nut with 24 mm wrench and engine sprocket & flywheel holder (09930–40113)

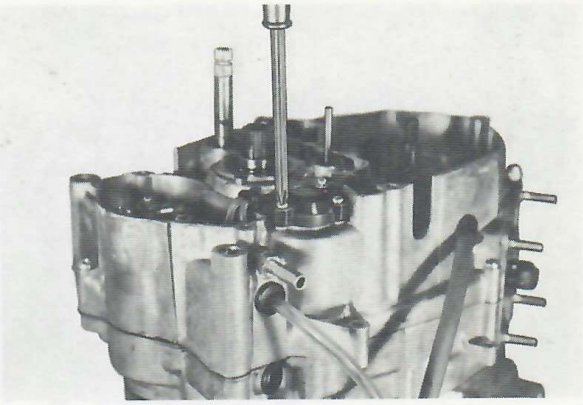


Fig. 7–3–14 Unscrewing neutral switch fitting screws with cross head screw driver

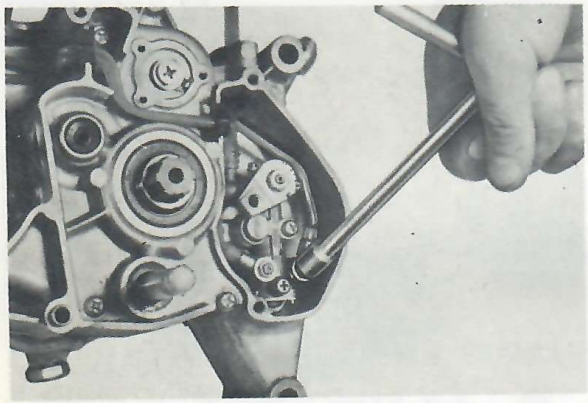


Fig 7–3–15 Unscrewing oil line union bolt with 8 mm wrench

Fig. 7–3–16 Pulling up oil line grommet

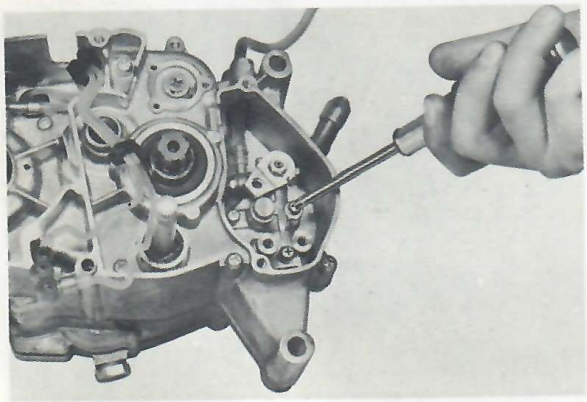


Fig. 7–3–17 Loosening oil pump fitting screws with cross head screw driver

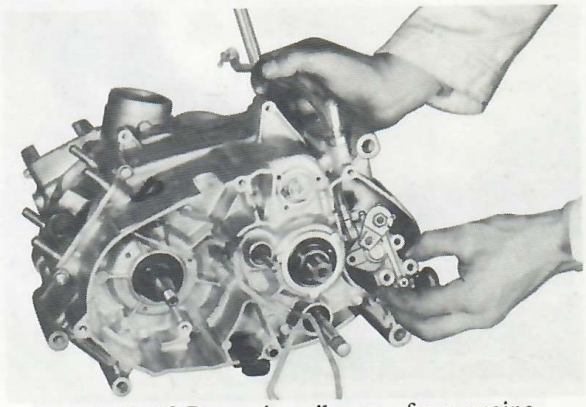


Fig. 7–3–18 Removing oil pump from engine

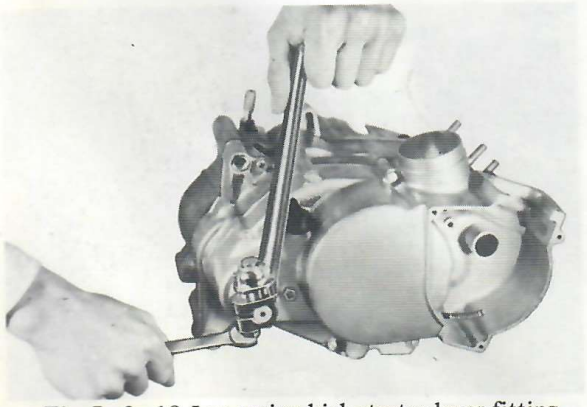


Fig. 7–3–19 Loosening kick starter lever fitting bolt and removing kick starter lever

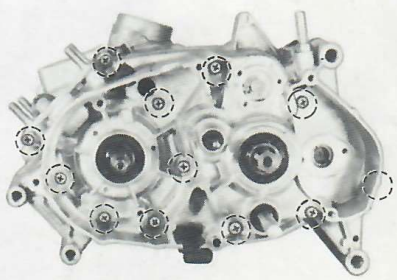


Fig. 7–3–20 Loosening left crankcase fitting screws with cross head screw driver

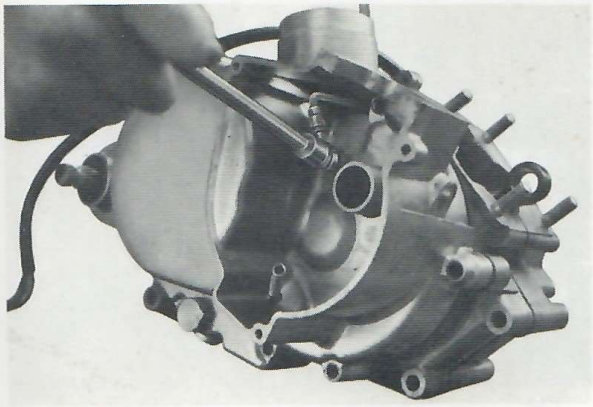


Fig. 7–3–21 Unscrewing oil line union bolt with 8 mm wrench

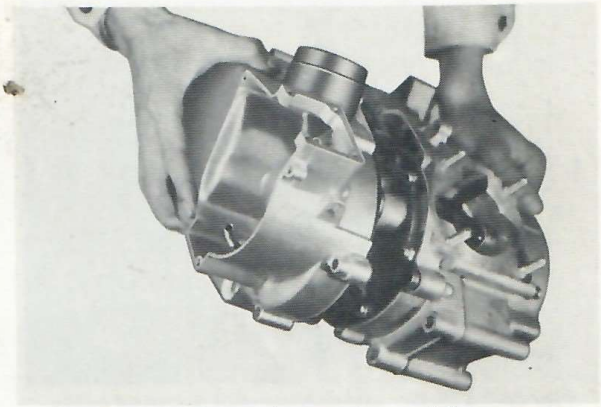


Fig. 7–3–22 Removing crankcase right cover.

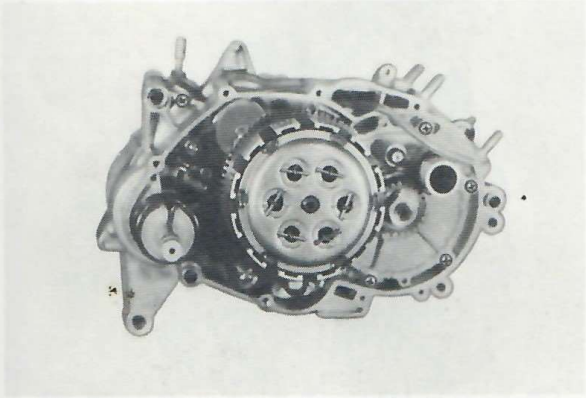


Fig. 7–3–23 Right crankcase side view

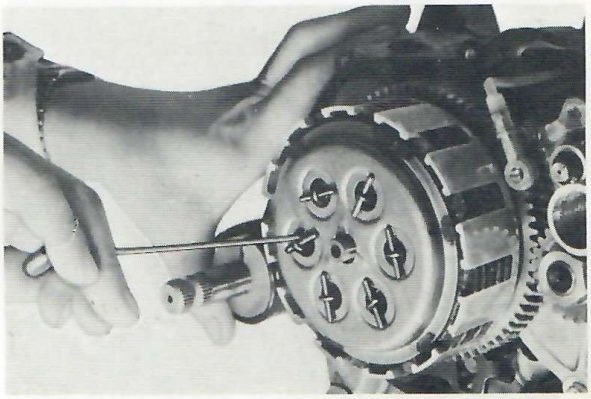


Fig. 7–3–24 Taking off clutch spring pins with clutch spring hook (special tool No. 09920–20310)

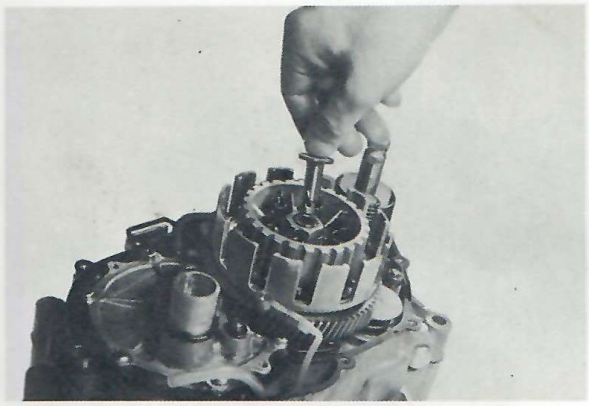


Fig. 7–3–25 Removing clutch release rod and clutch pressure plates

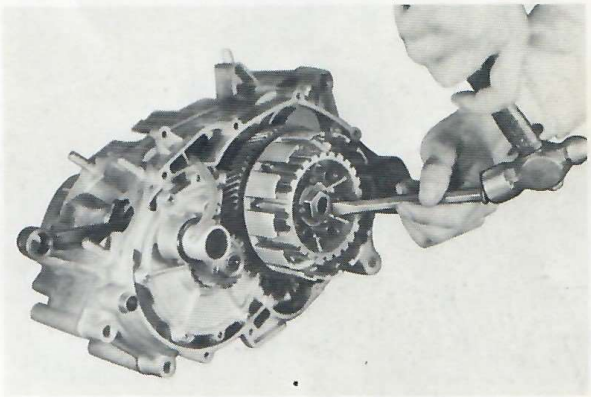


Fig. 7–3–26 Straightening clutch sleeve hub washer with chisel and hammer

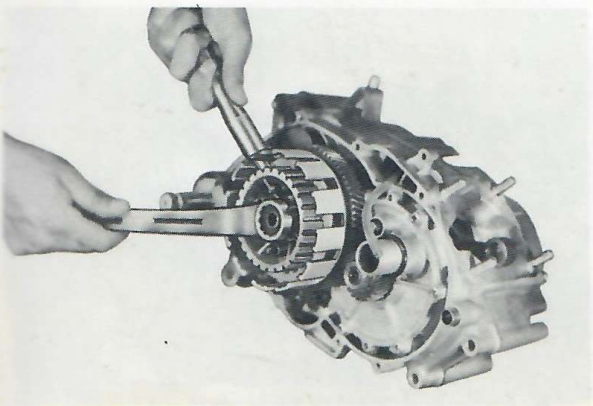


Fig. 7–3–27 Removing clutch sleeve hub

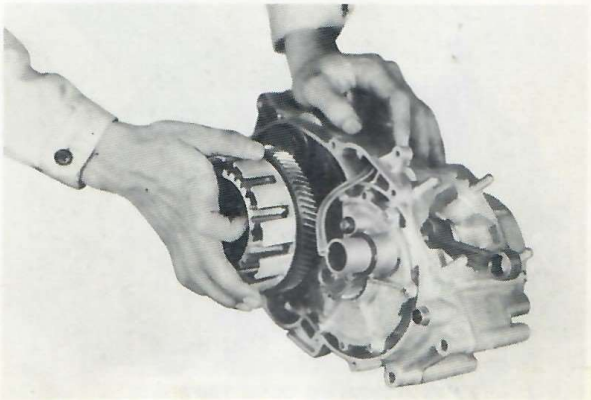


Fig. 7–3–28 Removing clutch housing gear

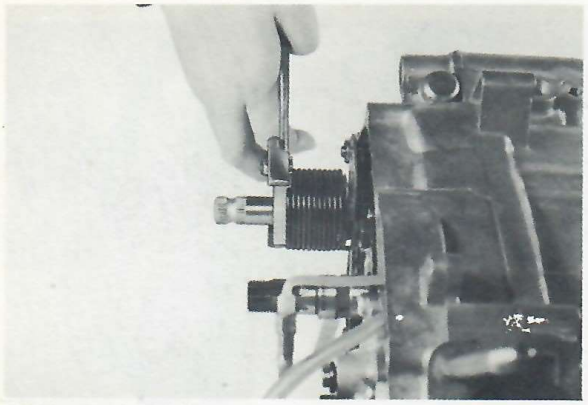


Fig. 7–3–29 Removing kick starter spring guide

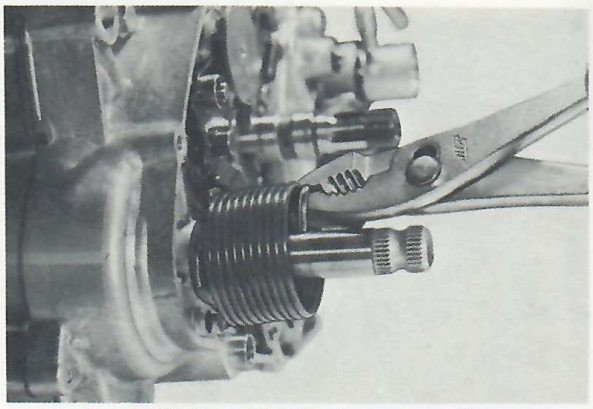


Fig. 7–3–30 Removing kick starter spring

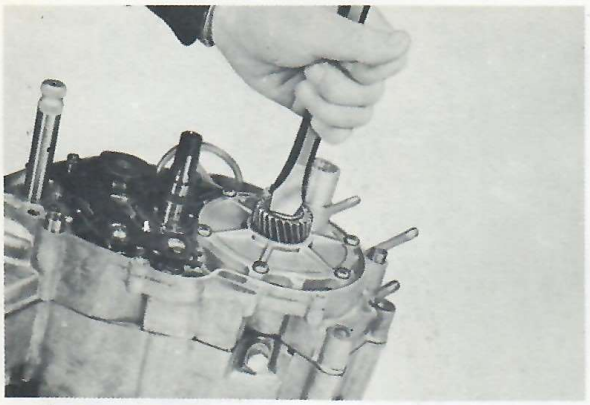


Fig. 7–3–31 Straightening primary drive gear washer with chisel and hammer

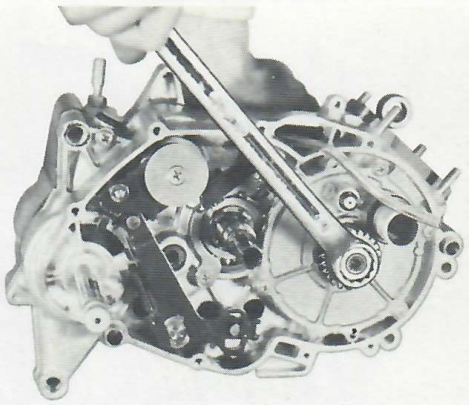


Fig. 7–3–32 Loosening primary drive gear set nut with 21 mm wrench and piston holder (special tool No. 09910–20111)

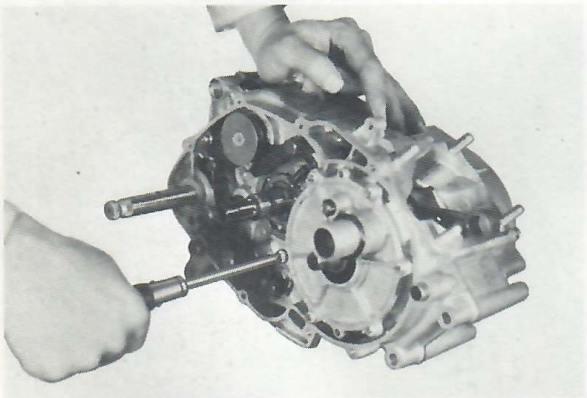


Fig. 7–3–33 Loosening outer valve seat fitting screws with cross head screw driver

Fig. 7–3–34 Removing key from crankshaft

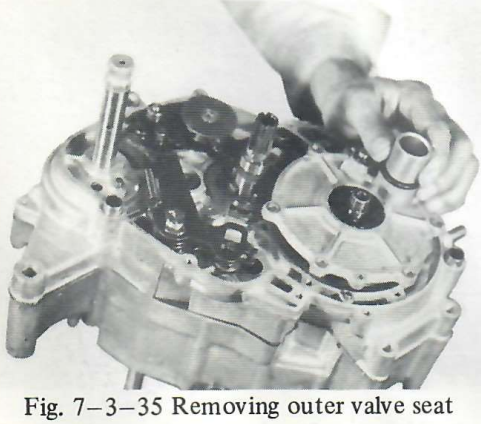


Fig. 7–3–35 Removing outer valve seat

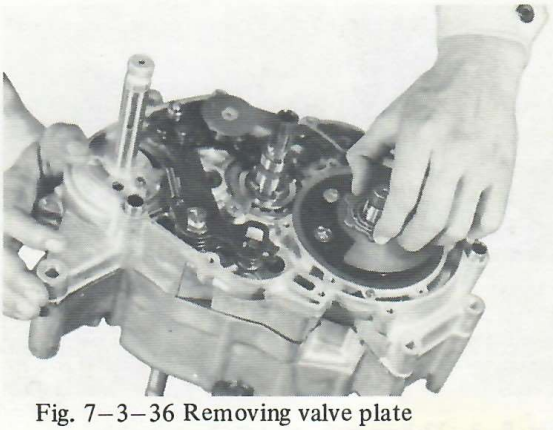


Fig. 7–3–36 Removing valve plate

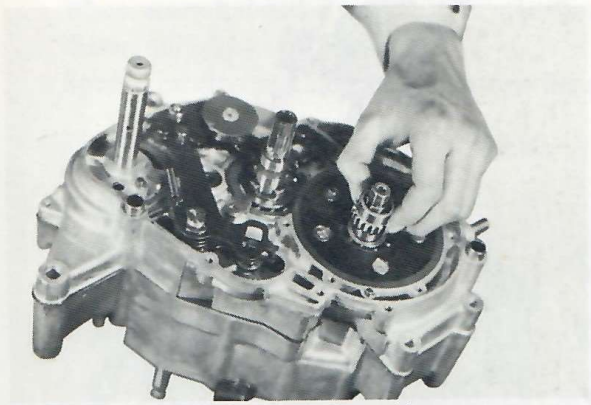


Fig. 7–3–37 Removing valve guide

Fig. 7–3–38 Removing valve guide positioning piece from crankshaft

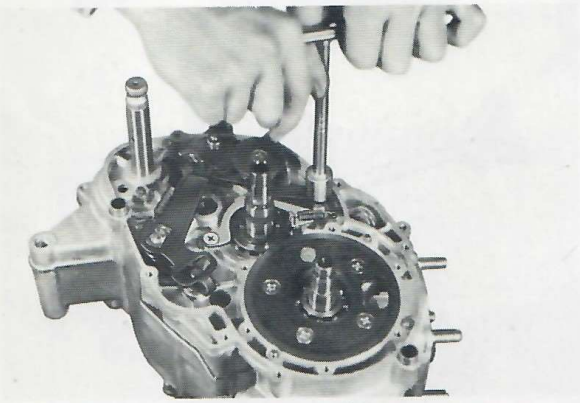


Fig. 7–3–39 Loosening shifting cam stopper bolt with 12 mm wrench

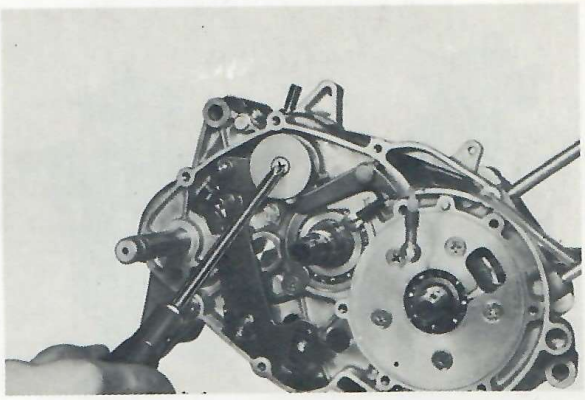


Fig. 7–3–40 Loosening gear shifting cam pin retainer fitting screw

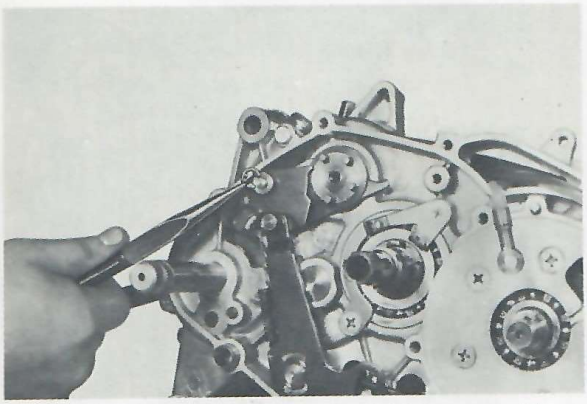


Fig. 7–3–41 Removing gear shifting cam guide and stopper set circlip

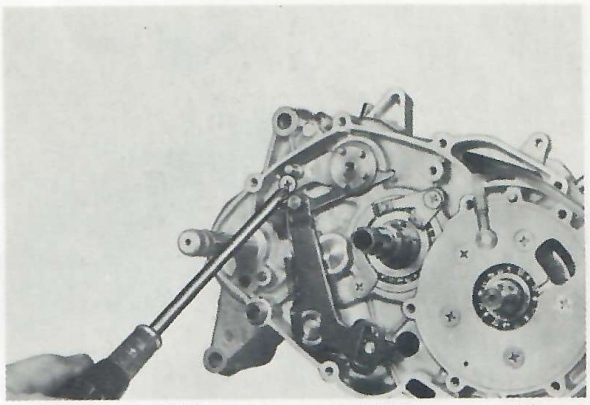


Fig. 7–3–42 Removing gear shifting cam guide

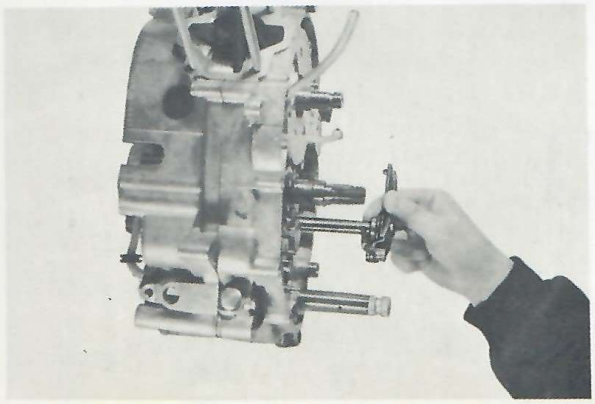


Fig. 7–3–43 Removing gear shifting shaft

Fig. 7–3–44 Taking off oil line union bolt inspection cap

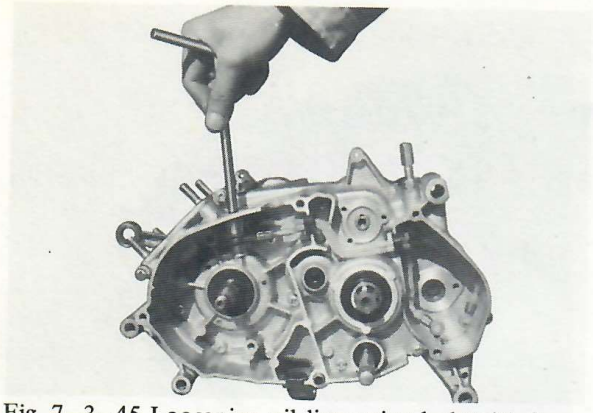


Fig. 7–3–45 Loosening oil line union bolt with 8 mm wrench

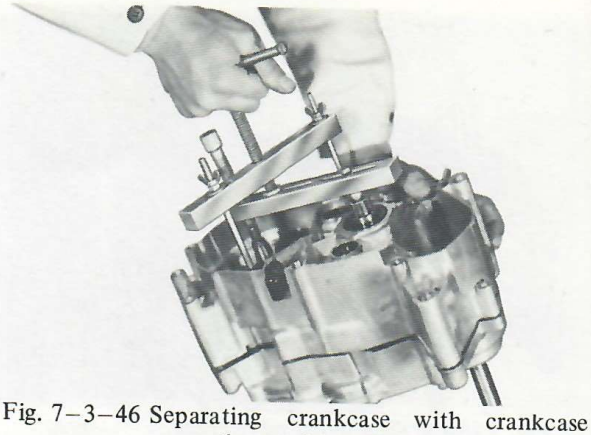


Fig. 7–3–46 Separating crankcase with crankcase separating tool (special tool No. 09910–80112)

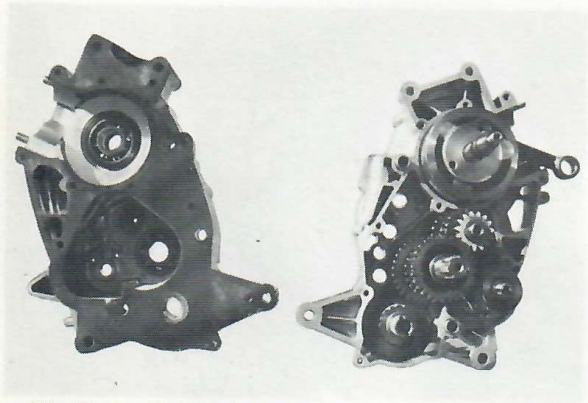


Fig. 7–3–47 Crankcase inside view

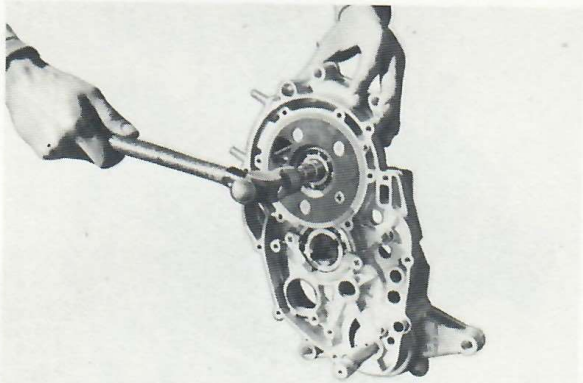


Fig. 7–3–48 Removing crankshaft from crankcase with a hammer

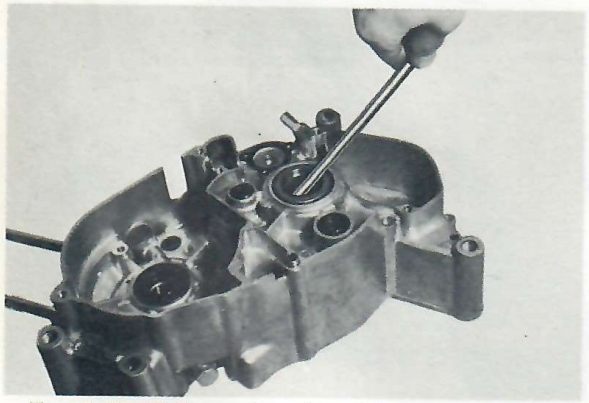


Fig. 7–3–49 Removing oil seal from crankcase

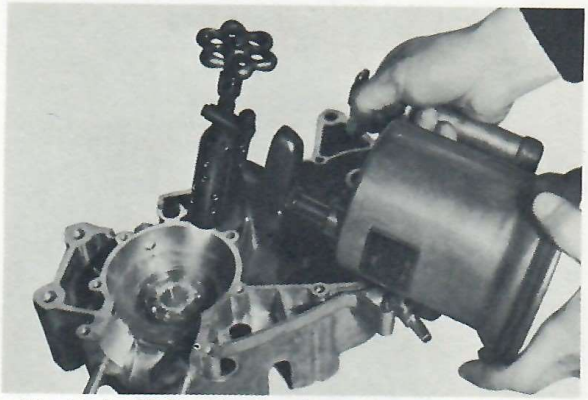


Fig. 7–3–50 Heating bearing outer race with a burner

Fig. 7–3–51 Removing bearing from crankcase

7–4. Tips on Assembling Engine

When assembling the engine after necessary inspections or repairs, follow the inverse procedures of disassembling.
Special caution and important matters for assembling are described in this section.

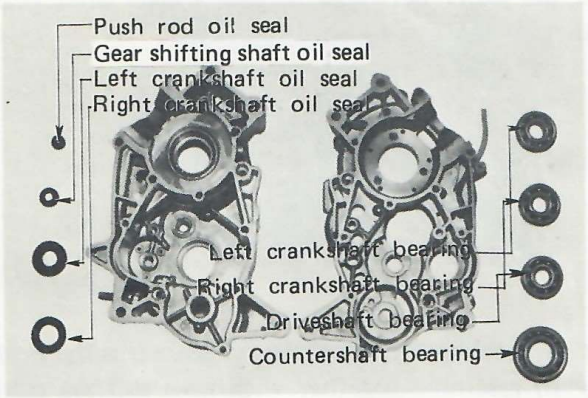


Fig. 7–4–1

When fitting bearings be sure to heat the crankcase around the bearing holes of crankcase with a burner until bearing can be installed by hand.

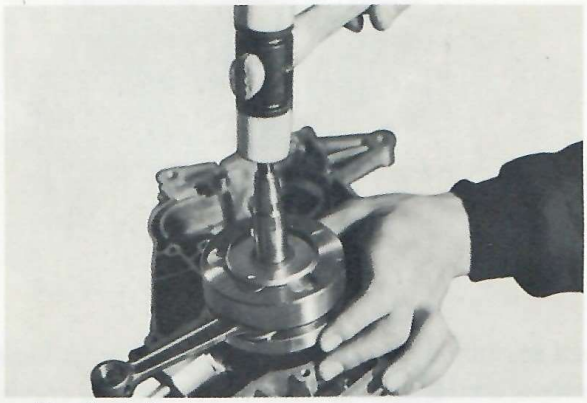


Fig. 7–4–2

When starting to assemble the crankshaft to the crankcase. Put the crankshaft into the crankcase right half, not into the left half.

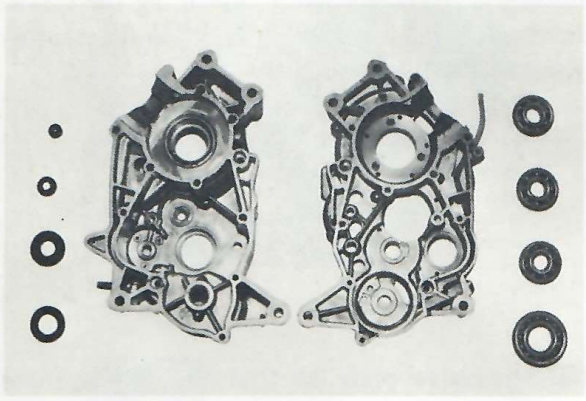


Fig. 7–4–3

When installing the oil seals, be sure to apply grease all round the lips, and unbend the lip of the oil seals by pulling the spacer up a bit with pliers without fail.

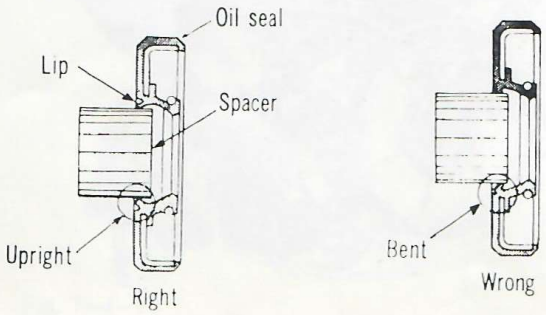


Fig. 7–4–4

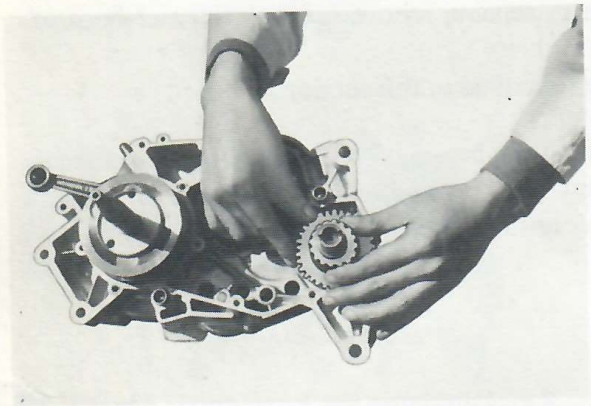


Fig. 7–4–5 Assembling kick starter gear

When assembling the kick starter gear be sure to fit the three thrust washers, two of which on either side of the kick starter shaft large section and the other between the kick starter drive gear and crankcase left half.

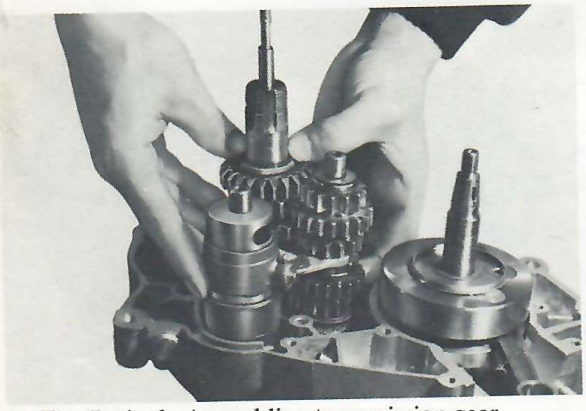


Fig. 7–4–6 Assembling transmission gear

For assembling the transmission gears it is the best way to assemble together with gear shifting cam on the crankcase right half.

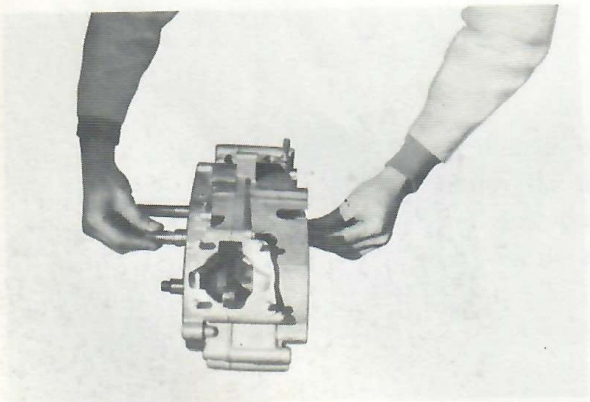


Fig. 7–4–7 Checking shafts turning

When assembling crankcase, tighten 12 cross head screws in a criss-cross fashion to prevent the crankcase from warping and the crank chamber from compression leakage. After tightening the screws again check if all shafts turn easily and smoothly by rotating them by hand.

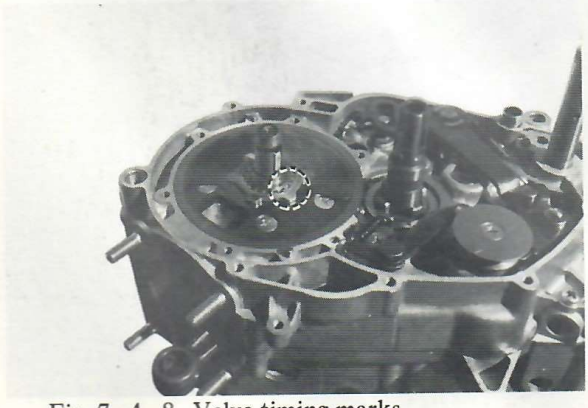


Fig. 7–4–8 Valve timing marks

Install the valve plate so that the timing mark punched on it faces outward and aligns with the valve guide pin set in the crankshaft.

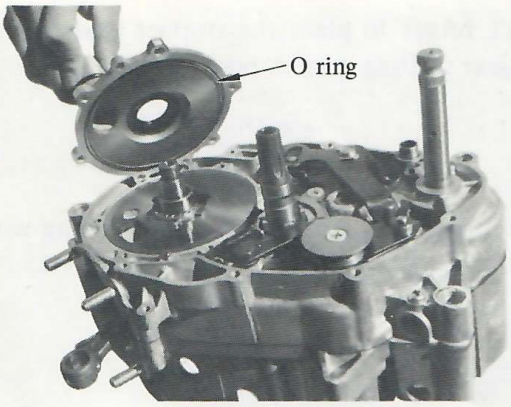


Fig. 7–4–9

When installing the outer valve seat first install the primary drive gear spacer and then install the outer valve seat. Never fail to install an "O" ring to the inner surface of the outer valve seat.

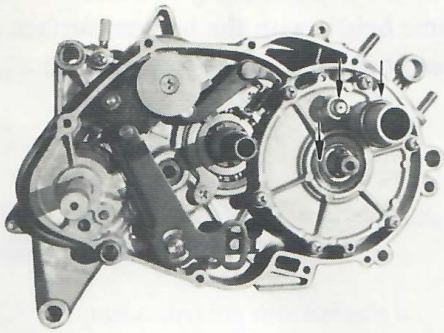


Fig. 7–4–10

Never fail to install four "O" rings in such positions as one between primary drive gear and primary drive gear spacer, another on carburetor inlet boss, the third on oil inlet boss of the outer valve seat, and the fourth between drive sprocket and drive sprocket spacer.

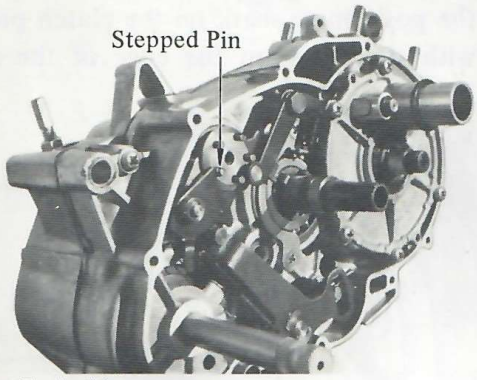


Fig. 7–4–11

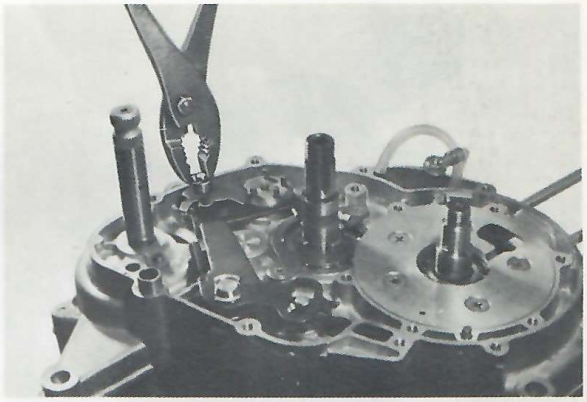


Fig. 7–4–12

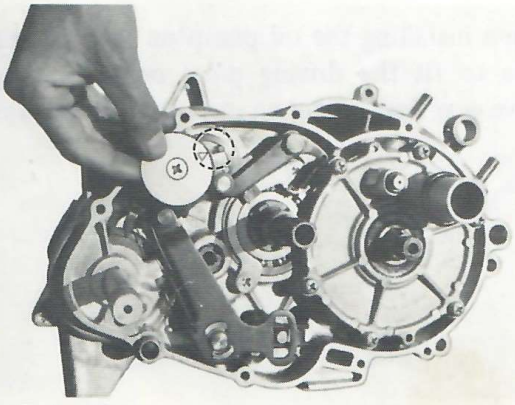


Fig. 7–4–13

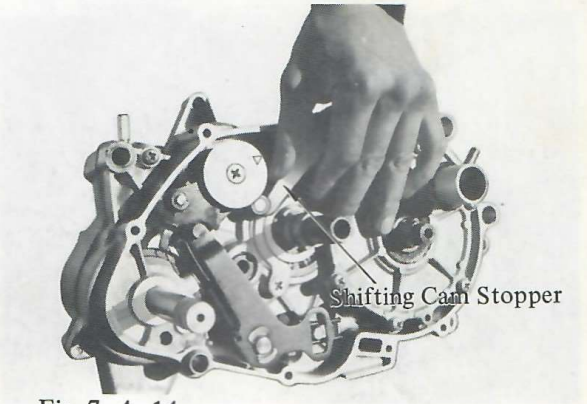


Fig. 7–4–14

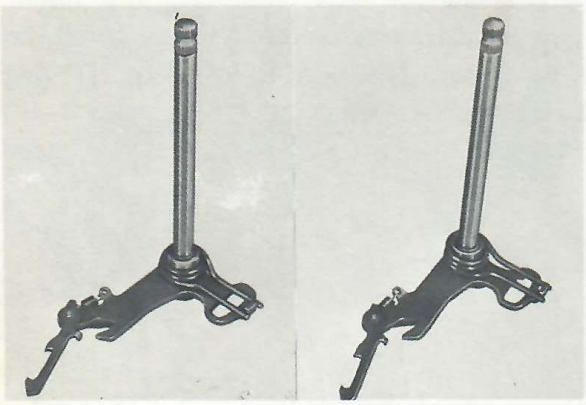


Fig. 7–4–15 Gear shifting shaft return spring

Don't forget to place the stopper washer beneath the gear shifting cam stopper. Fig. 7–4–14.

Fit the gear shifting shaft return spring with less-bent side down to the shaft. Fig. 7–4–15.

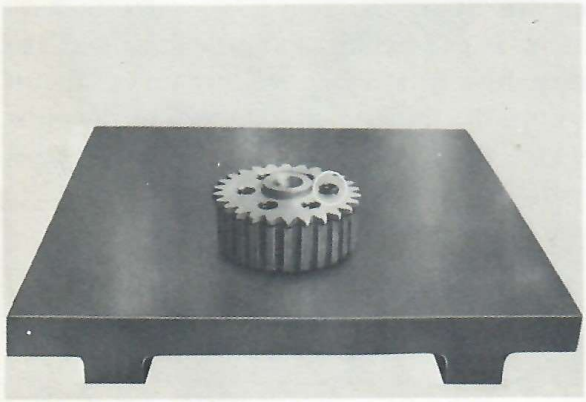


Fig. 7–4–16 Checking clutch sleeve hub

Make sure that the clutch spring bottom ends are kept in the same height with the bottom surface of the clutch sleeve hub and do not protrude.

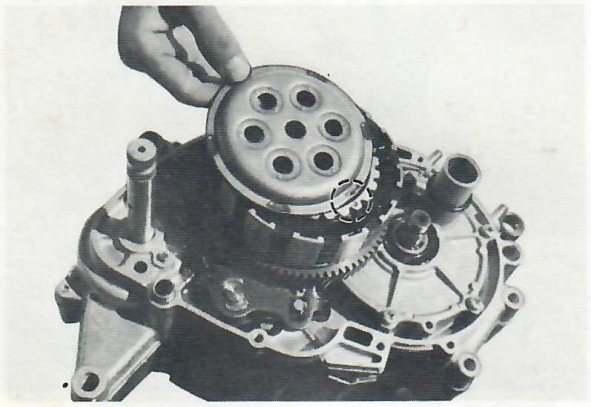


Fig. 7–4–17 Alignment marks of clutch sleeve hub and clutch pressure plate

Align the positioning mark on the clutch pressure plate with the mark on the edge of the clutch sleeve hub.

Fig. 7–4–18 Installing oil pump driving piece on kick starter drive gear

When installing the oil pump on the crankcase, be sure to fit the driving piece on the kick starter drive gear first, and then install the oil pump.

Fig. 7–4–19 Piston ring knock pin

When fitting the piston rings to the piston, take care of the stamped mark facing upward, and align the piston ring open ends with the piston ring locating pin set in the piston ring groove.

7–5. Engine Mechanism

7–5–1. Oil pump

The oil pump driving mechanism, the oil pump construction and the oil pump performance are described below.

☐ Oil pump driving mechanism

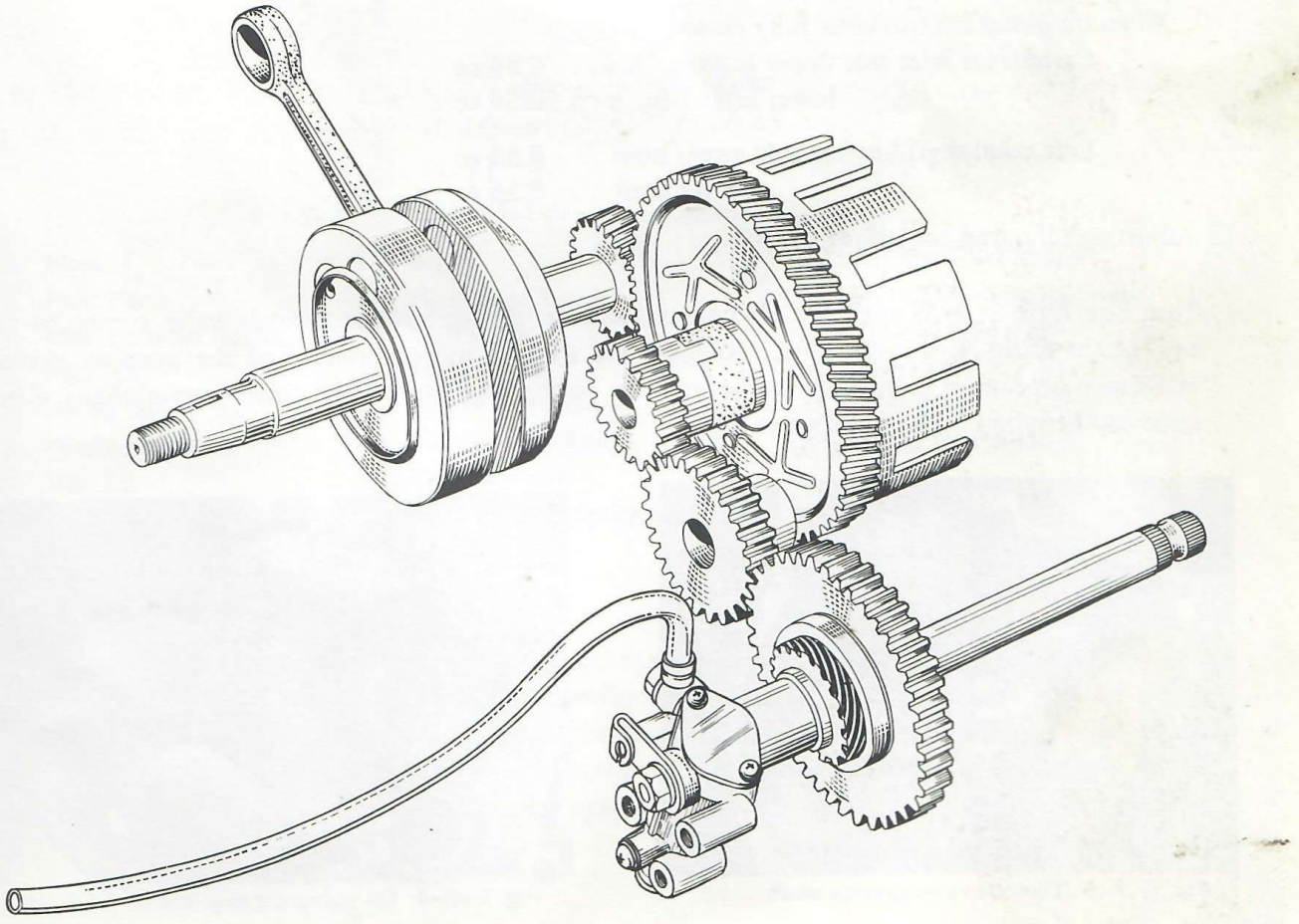


Fig. 7–5–1 Oil pump driving mechanism

The oil pump driving force is transmitted from the crankshaft to the oil pump through the primary drive gear, the primary driven gear, the kick starter driven gear, the kick starter idle gear, the kick starter drive gear and the oil pump driving piece.
The number of teeth and the reduction ratio are as follows.

Gear	Teeth
Primary drive gear	23
Primary driven gear	73
Kick starter driven gear	16
Kick starter idle gear	26
Kick starter drive gear	33

Oil pump reduction ratio: 73/23 x 33/16
= 6.55/1

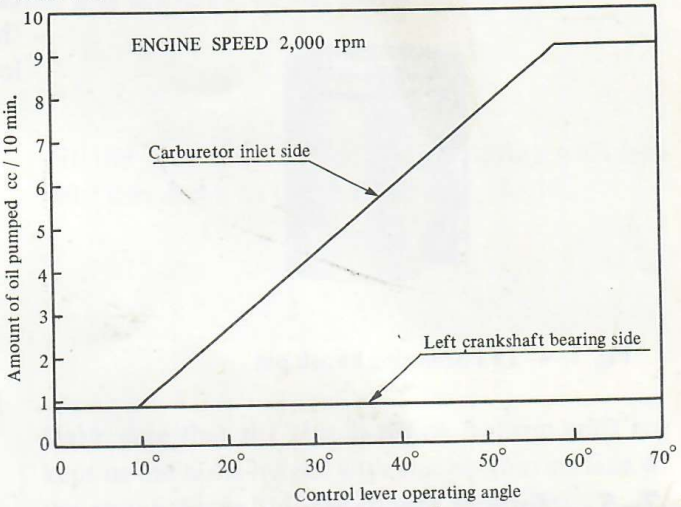


Fig. 7–5–2 Oil pump performance curves

Amount of oil pumped in 10 minutes with engine speed kept at 2,000 rpm.

When oil pump control lever fully opened
Carburetor inlet side upper limit . . . . . 7.71 cc
lower limit . . . . . 6.30 cc

Left crankshaft bearing side upper limit . . . 0.84 cc
lower limit . . . 0.56 cc

When oil pump control lever fully closed
Carburetor inlet side upper limit . . . . . 0.84 cc
lower limit . . . . . 0.56 cc

Left crankshaft bearing side upper limit . . . 0.84 cc
lower limit . . . 0.56 cc

☐ Adjusting oil pump control wire

Turn the throttle grip until the alignment mark on the carburetor throttle valve comes to upper end of the carburetor main bore. Keeping the throttle valve unmoved at the position explained in former procedure, adjust the cable adjuster so that the line on the control lever aligns with the same on the pump body as shown in figure.

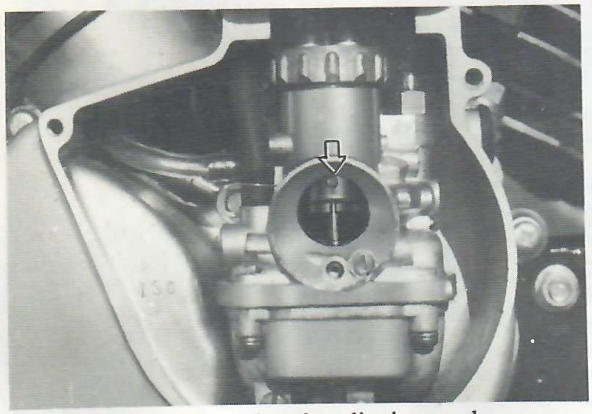


Fig. 7–5–3 Throttle valve aligning mark

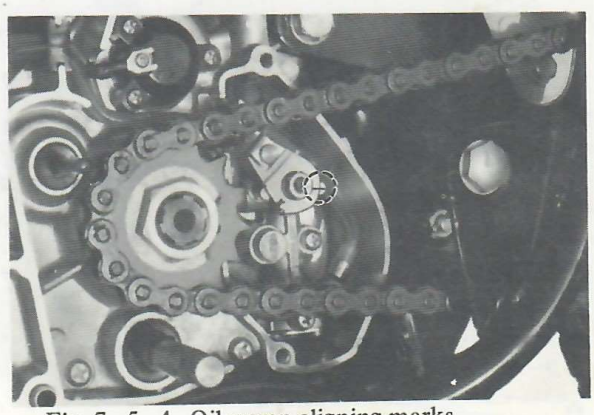


Fig. 7–5–4 Oil pump aligning marks

7–5–2. Carburetor

☐ Carburetor Construction

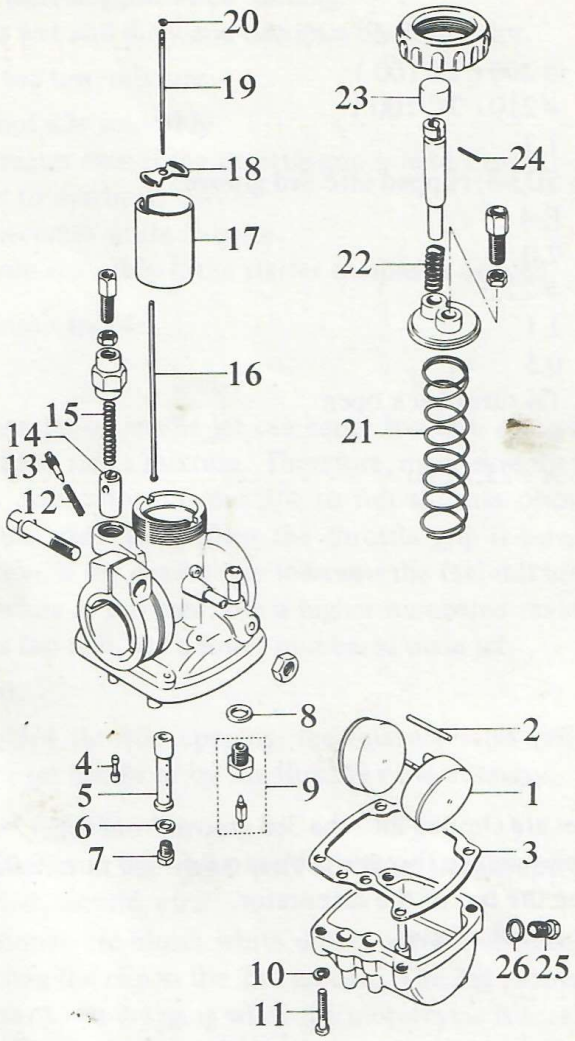


Fig. 7–5–5 Exploded view of carburetor

1. Float
2. Float Pin
3. Float Chamber Gasket
4. Pilot Jet
5. Needle Jet
6. Needle Jet Washer
7. Main Jet
8. Valve Seat Gasket
9. Needle Valve Ass'y
10. Lock Washer
11. Screw
12. Pilot Screw Spring
13. Pilot Screw
14. Starter Valve
15. Starter Valve Spring
16. Throttle Stop Rod
17. Throttle Valve
18. Throttle Valve Spring Seat
19. Jet Needle
20. Needle Clip
21. Throttle Valve Spring
22. Throttle Stop Screw Spring
23. Throttle Stop Cap
24. Cotter Pin
25. Drain Plug
26. Drain Plug Gasket

The carburetor meters the amount of fuel which the engine requires. The carburetor supplies a proper fuel/air mixture according to various conditions. The VM19SC carburetor is used on the model TS100/TC100, which is very compact as the float chamber is unitconstructed with the mixing chamber. The mixing chamber incorporates a starter system which supplies a specially rich fuel/air mixture for starting a cold engine. The starter system is operated by a lever fitted to the handlebar switch box.

☐ Carburetor specification

Main jet	#200 (TS 100) #210 (TC 100)
Air jet	1.3
Jet needle	5D3-3, clipped into 3rd groove
Needle jet	E-4
Throttle valve cut away	2.0
Pilot jet	#22.5
By pass	1.1
Pilot outlet	0.5
Pilot air adjusting screw	1½ turns back open
Starter jet	#80
Float level	A : 25.1 mm

☐ Adjusting

A. Adjusting idling

A–1. Preparations

A–1–1. Make sure the jet needles are clipped into the 3rd groove from top.

A–1–2. At full throttle adjust play in the throttle cables to 0.5–1.0 mm (0.02–0.04 in) with the throttle cable adjuster on the top of the carburetor.

A–1–3. Warm the engine up for a few minutes.

B. Adjusting system

B–1. Turn the pilot air screw on its pointed side down to the bottom, then turn it back out 1.1/2.

B–2. Start the engine in such conditions.

B–3. Adjust the throttle valve adjusting screw until the engine runs at its lowest rpm.

B–4. Turn the pilot air adjusting screw in and out within the range of 1/4 of a turn form the standard setting. The engine rpm will increase and decrease in accordance with the turning of the screw. Find the position where the engine runs regularly and smoothly at the lowest rpm and fix the screw there.

B–5. After adjusting the pilot air adjusting screw, adjust the throttle valve adjusting screw again and determine the engine idling speed.

C. Adjusting fuel/air mixture

C–1. Checking mixture

Too rich or too lean fuel adversely affects engine performance. The fuel/air mixture can be adjusted by adjusting carburetor setting. Check to see that the fuel and air is properly mixed.

C–1–1. Symptom of too rich mixture

a. Exhaust fumes are dense and bluish white in color.
b. The motorcycle feels sluggish when running.
c. The spark plug is wet and dirty and becomes black in color.

C–1–2. Symptom of too lean mixture

a. The engine will not idle smoothly.
b. Engine rpm fluctuates even if the throttle grip is held steady.
c. The engine is apt to overheat.
d. The spark plug becomes white in color.
e. The engine will run smoothly if the starter channel is opened.

C–2. Adjusting for various speeds

C–2–1. High speeds

A clogged main jet or needle jet can cause too lean a mixture, while a clogged air jet or loose main jet too rich a mixture. Therefore, make sure they are in good condition before adjusting the carburetor. From 3/4 to full throttle opening, the mixture ratio can be adjusted by the main jet. When the throttle grip is turned back slightly from the full throttle position, if the engine rpm increases the fuel mixture is too rich.
When the mixture is too lean, use a higher numbered main jet than the standard. When the mixture is too rich, use a lower numbered main jet.

C–2–2. Medium speeds

From 1/4 to 3/4 throttle opening, the mixture ratio can be adjusted by changing the position of the jet needle or by the throttle valve cutaway.

a. Adjusting with jet needle

There are five grooves at the upper part of the jet needle and they are counted from the top to the bottom, first, second, etc.
If the exhaust fumes are bluish white due to a too rich fuel mixture, lower the jet needle one notch by fitting the clip in the 2nd groove. The 3rd groove is standard setting.
If the engine seems to be dragging when the motorcycle is accelerating or running it indicates that the fuel mixture is too lean. Raise the jet needle by one notch.

b. Adjusting with throttle valve cutaway

A higher numbered throttle valve cutaway gives a leaner mixture and a lower numbered one a richer mixture. The standard throttle valve cutaway for TS100 and TC100 is 2.0.
A different size throttle valve cutaway, however, seriously affects engine operation below 1/4 throttle opening.
Do not change the throttle valve cutaway unless it is urgently necessary.

c. Low speeds

A clogged pilot air passage or clogged pilot jet bleed holes can cause too rich a mixture and a clogged pilot jet or pilot outlet too lean a mixture. Make sure they are not clogged. From 1/8 to 1/4 throttle opening, the mixture ratio can be adjusted with the pilot air adjusting screw. Refer to the Adjusting idling section above.

Throttle Opening	Too Rich Mixture	Too Lean Mixture
0–1/8	Turn pilot air adjusting screw out	Turn pilot air adjusting screw in
1/8–1/4	* Use throttle valve with larger cutaway	* Use throttle valve with smaller cutaway
1/4–3/4	Lower jet needle	Raise jet needle
3/4–full	Use smaller numbered main jet	Use larger numbered main jet

* Refrain from replacing the throttle valve if possible and use other methods to adjust the carburetor.

D. Adjusting float level

To measure the float level of Model TS100 and TC100, follow the steps given below.

a. Remove the float bowl.
b. Hold the carburetor upside down.
c. Lower the float until the float tongue "A" just contacts the tip of float valve "B". Do not compress the float valve spring.
d. Measure the distance between the float bowl seeting surface of the carburetor body and the bottom of the float assembly.
d–1. If your measurement is less than 25.1 mm (0.988 in) bend the float tongue towards the needle valve "B".
d–2. If your measurement is more than 25.1 mm (0.988 in) bend the float tongue "A" away from the needle valve "B".

Carburetor float level
25.1 mm (0.988 in)

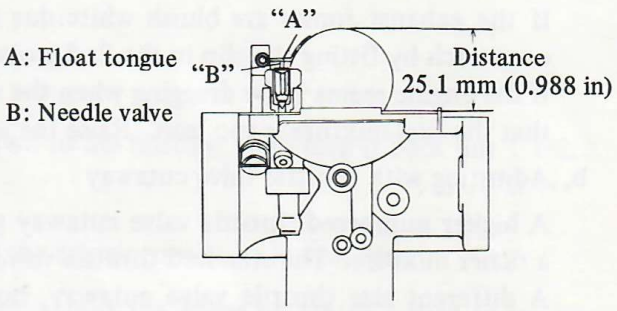


Fig. 7–5–6 Adjusting fuel level

7–5–3. TS100 Transmission

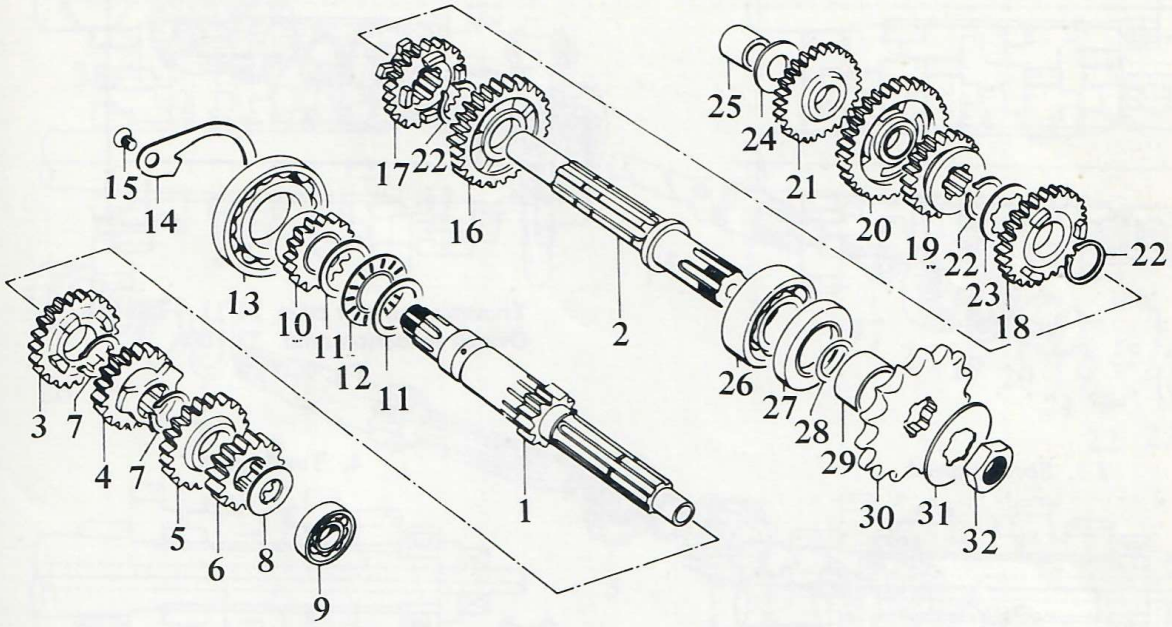


Fig. 7–5–7 Exploded view of TS100 transmission

1. Counter Shaft NT:11, L =179.5
2. Drive Shaft
3. 5th Drive Gear NT:23
4. 3rd Drive Gear NT:18
5. 4th Drive Gear NT:20
6. 2nd Drive Gear NT:15
7. Counter Shaft Circlip
8. Washer 12x20x2
9. Counter Shaft LH Bearing
10. Kick Starter Driven Gear NT:16
11. Bearing Washer 21x30x0.8
12. Kick Starter Driven Gear Bearing 21x35x2.8
13. Counter Shaft RH Bearing 30x62x10
14. Counter Shaft Bearing Plate
15. Screw
16. 2nd Driven Gear NT:28
17. 4th Driven Gear NT:22
18. 3rd Driven Gear NT:25
19. 5th Driven Gear NT:20
20. 1st Driven Gear NT:31
21. Kick Starter Idle Gear NT:26
22. Drive Shaft Circlip
23. 3rd Driven Gear Washer
24. Washer
25. Drive Shaft Bushing
26. Drive Shaft Bearing
27. Drive Shaft Oil Seal
28. Spacer O Ring
29. Engine Sprocket Spacer 20x25x13.5
30. Engine Sprocket NT:13
31. Engine Sprocket Washer
32. Nut

A constant-mesh five speed transmission is mounted on the TS100 to enable the rider to select the correct gear according to running speed.
The engagement of the pinion and the gear at each speed is described in this paragraph.

1. Neutral

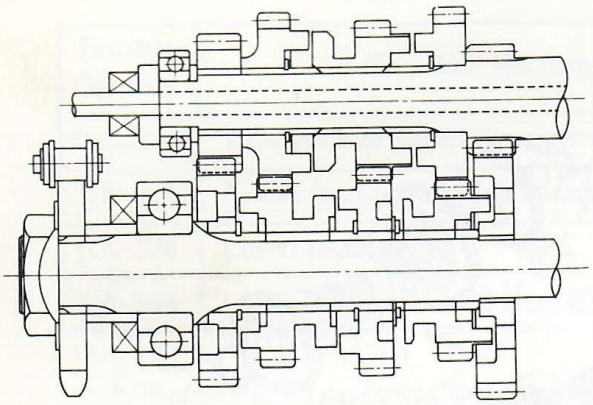
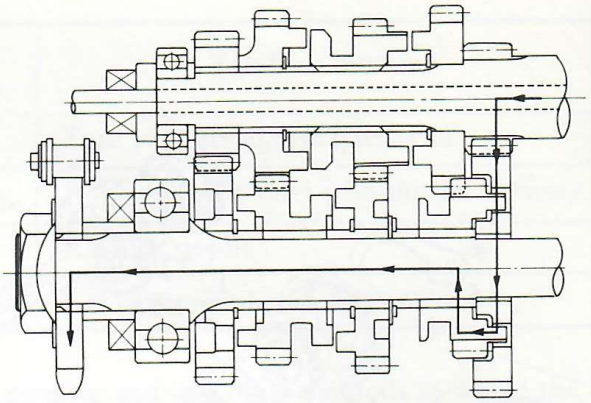


Fig. 7–5–8

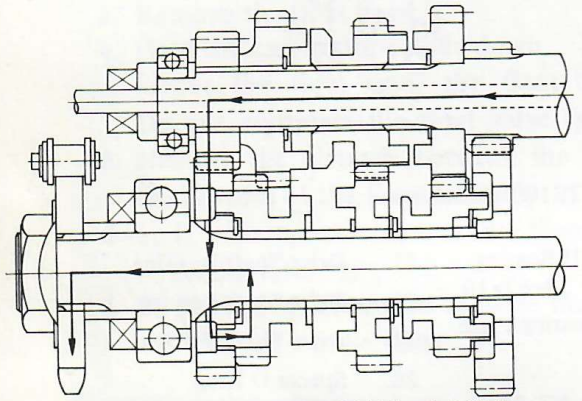
2. Low speed



Transmission gear ratio 31/11 = 2.818/1
Overall reduction ratio 33.70/1

Fig. 7–5–9

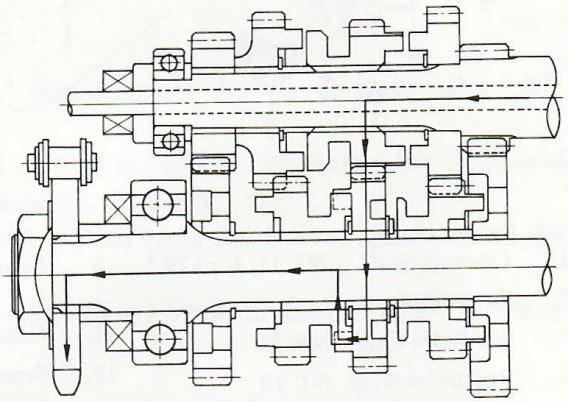
3. Second speed



Transmission gear ratio 28/15 = 1.866/1
Overall reduction ratio 22.32/1

Fig. 7–5–10

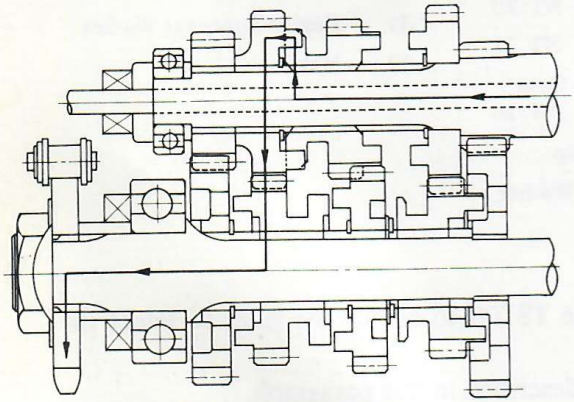
4. Third speed



Transmission gear ratio 25/18 = 1.388/1
Overall reduction ratio 16.60/1

Fig. 7–5–11

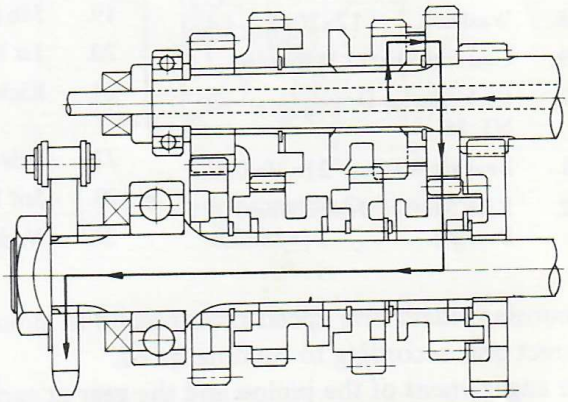
5. Fourth speed



Transmission gear ratio 22/20 = 1.100/1
Overall reduction ratio 13.15/1

Fig. 7–5–12

6. Top speed



Transmission gear ratio 20/23 = 0.869/1
Overall reduction ratio 10.39/1

Fig. 7–5–13

7–5–4. TC100 Transmission

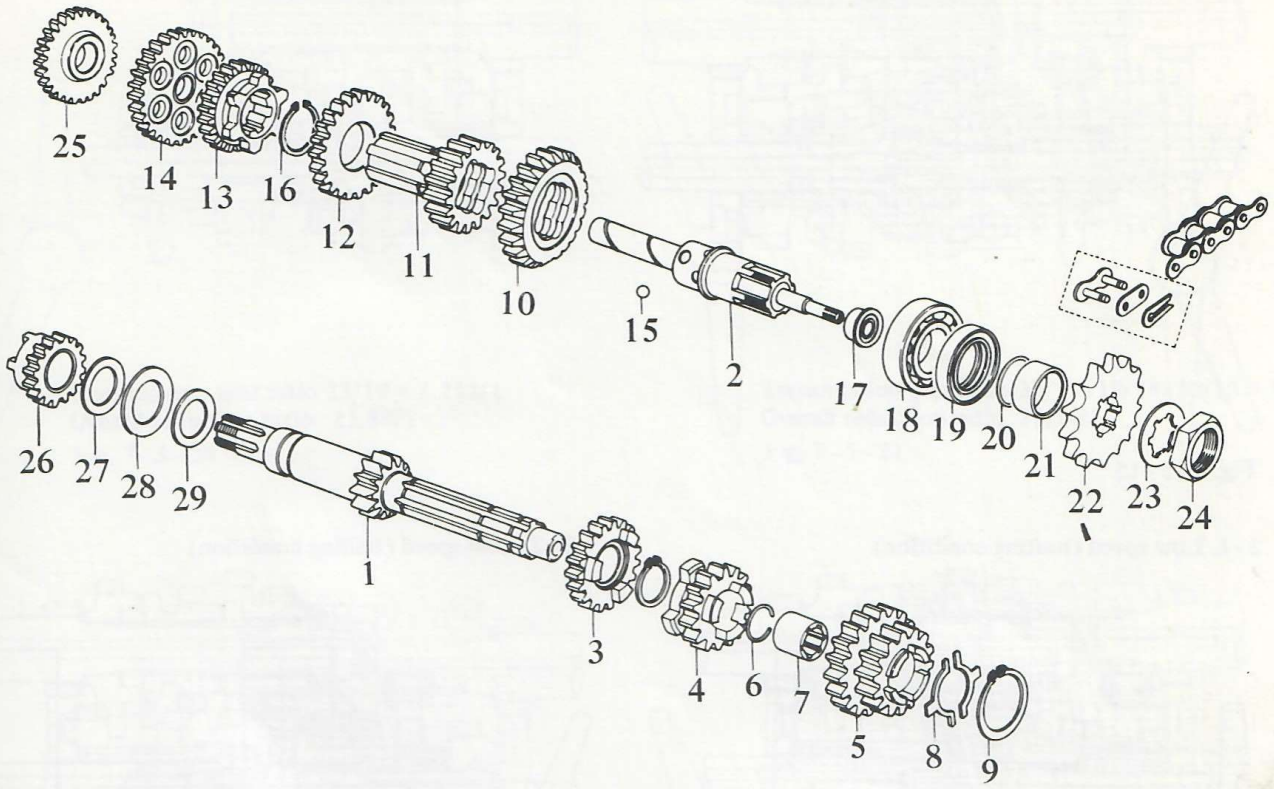


Fig. 7–5–15 Exploded view of TC100 transmission

1.	Counter Shaft	NT:12
2.	Drive Shaft	
3.	3rd Drive Gear	NT:19
4.	2nd Drive Gear	NT:14
5.	4th Drive Gear	NT:13/19
6.	Sleeve Circlip	
7.	4th Drive Gear Sleeve	
8.	4th Drive Gear Ring	
9.	4th Drive Gear Circlip	
10.	Reduction Gear	NT:20
11.	4th Driven Gear	NT:18
12.	2nd Driven Gear	NT:23
13.	3rd Driven Gear	NT:23
14.	1st Driven Gear	NT:30
15.	Steel Ball	
16.	2nd Driven Gear Circlip	
17.	Oil Seal	
18.	Ball Bearing	
19.	Drive Shaft Oil Seal	
20.	Spacer O Ring	
21.	Engine Sprocket Spacer	25×30×13.5
22.	Engine Sprocket	NT:13
23.	Engine Sprocket Washer	
24.	Nut	
25.	Kick Starter Idle Gear	NT:26
26.	Kick Starter Driven Gear	NT:16
27.	Kick Starter Drive Gear Bearing Washer	
28.	Kick Starter Drive Gear Bearing	
29.	Kick Starter Drive Gear Bearing Washer	

As the "SUZUKI Posi-Select Mechanism" is built in TC100, it is possible to readily convert the gearings from touring (trailing) to trailing (touring) each other by operating the posi-select lever.
A return type gear shifting mechanism and a 4 speed constant mesh gearing system for both the trailing and touring uses are incorporated in the transmission.
The engagement of the pinion and the gear at each speed in both the trailing and touring use is described in this paragraph.

1. Neutral

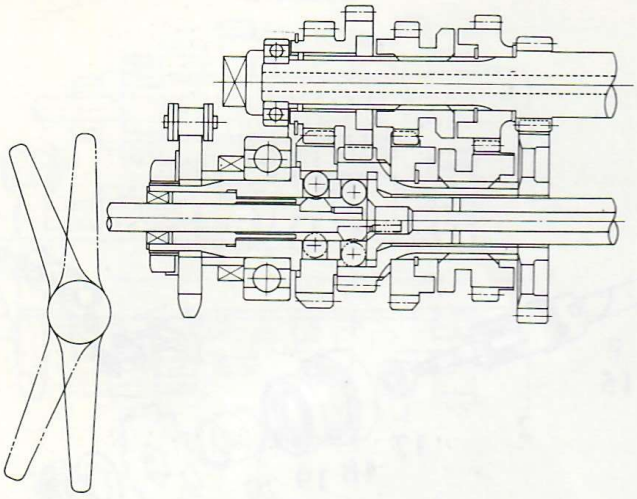
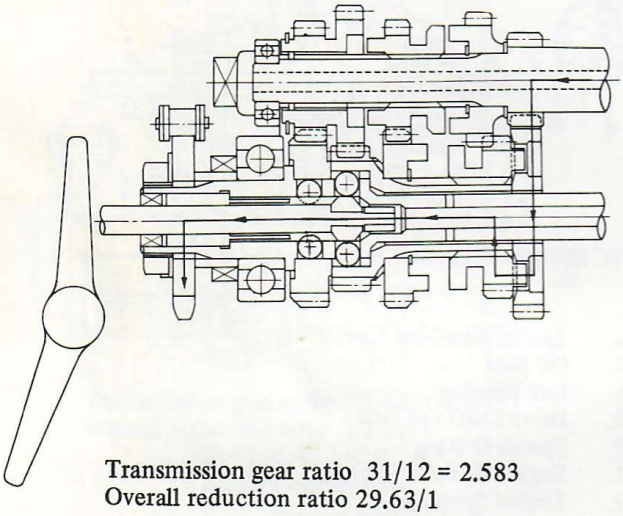


Fig. 7–5–15

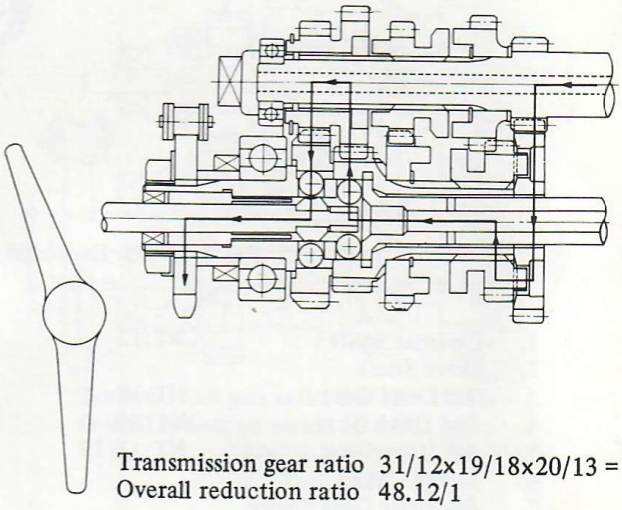
2–1. Low speed (touring condition)



Transmission gear ratio 31/12 = 2.583
Overall reduction ratio 29.63/1

Fig. 7–5–16

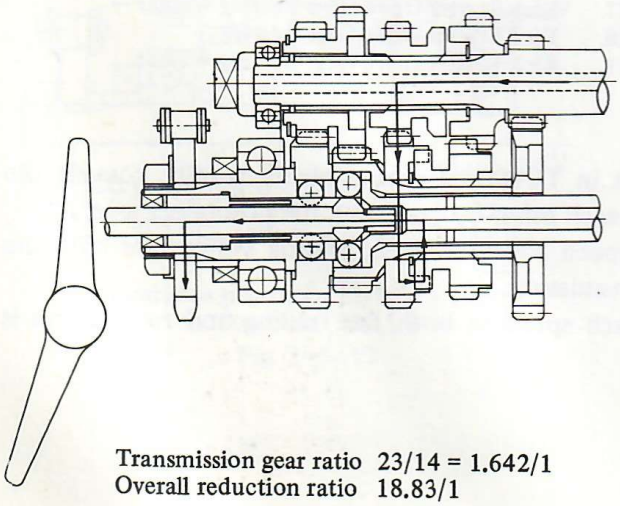
2–2. Low speed (trailing condition)



Transmission gear ratio 31/12x19/18x20/13 = 4.195/1
Overall reduction ratio 48.12/1

Fig. 7–5–17

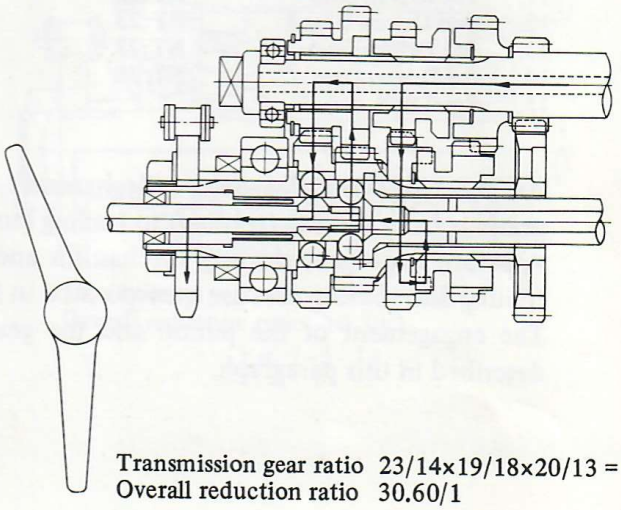
3–1. Second speed (touring condition)



Transmission gear ratio 23/14 = 1.642/1
Overall reduction ratio 18.83/1

Fig. 7–5–18

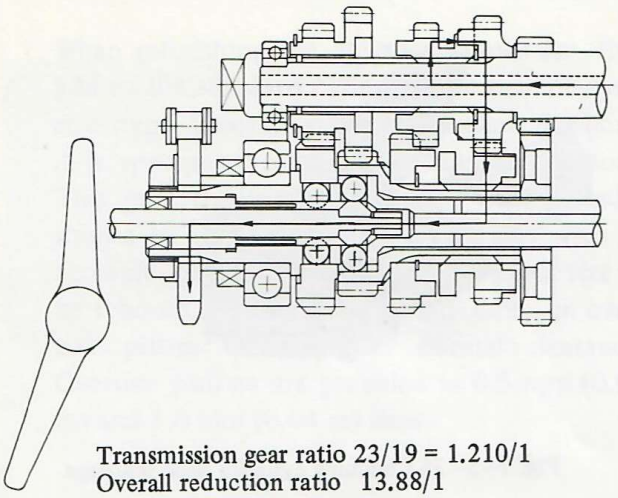
3–2. Second speed (trailing condition)



Transmission gear ratio 23/14x19/18x20/13 = 2.667/1
Overall reduction ratio 30.60/1

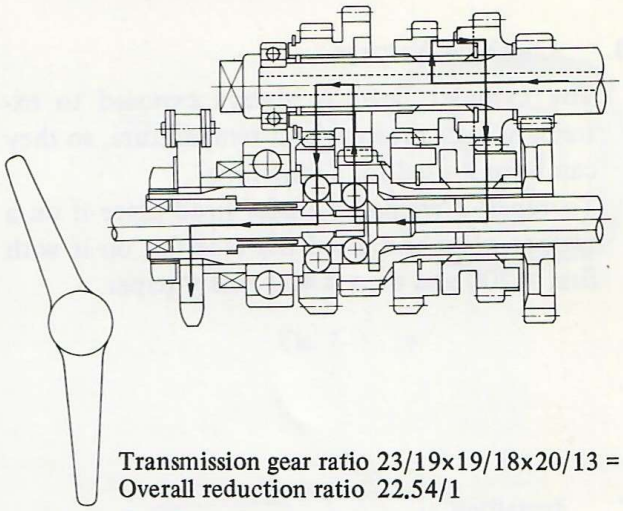
Fig. 7–5–19

4–1. Third speed (touring speed)

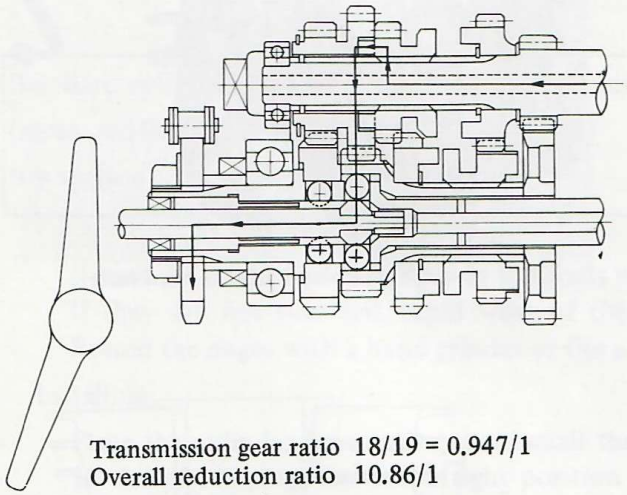


Transmission gear ratio 23/19 = 1.210/1
Overall reduction ratio 13.88/1
Fig. 7–5–20

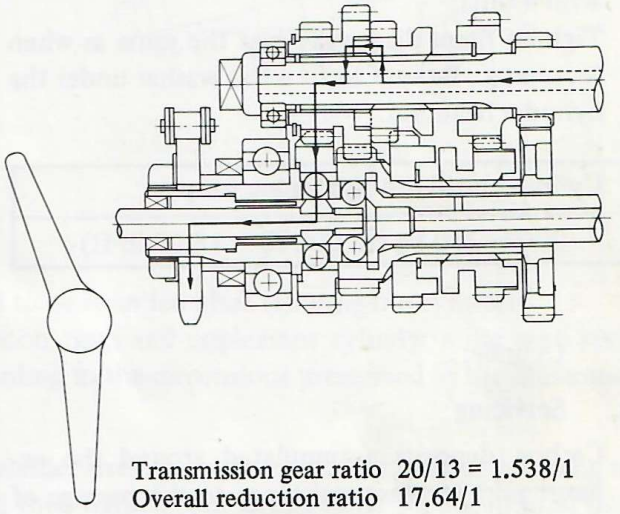
4–2. Third speed (trailing condition)



Transmission gear ratio 23/19x19/18x20/13 = 1.965/1
Overall reduction ratio 22.54/1
Fig. 7–5–21



Transmission gear ratio 18/19 = 0.947/1
Overall reduction ratio 10.86/1
Fig. 7–5–22



Transmission gear ratio 20/13 = 1.538/1
Overall reduction ratio 17.64/1
Fig. 7–5–23

7–5–5. Specification for Inspection and Repair

Engine

1. Cylinder head

A. Removing carbon deposits

Although carbon accumulation has been minimized by the adoption of Suzuki CCI, it is advised to remove carbon deposits in the combustion chamber with a screw driver bit or something like that every 6,000 km (4,000 mi) taking care not to damage dome surface.

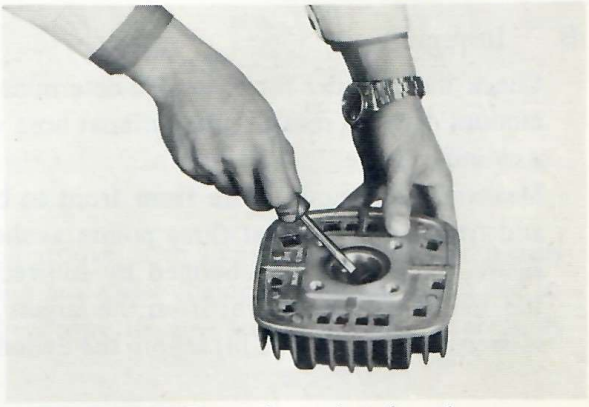


Fig. 7–5–24 Removing carbon deposits

B. Checking Warpage

The cylinder head is always exposed to extremely high pressure and temperature, so they can warp if used for a long time.

To repair a warped cylinder head place it on a surface plate and grind the face flat on it with first # 200 and then # 400 emery paper.

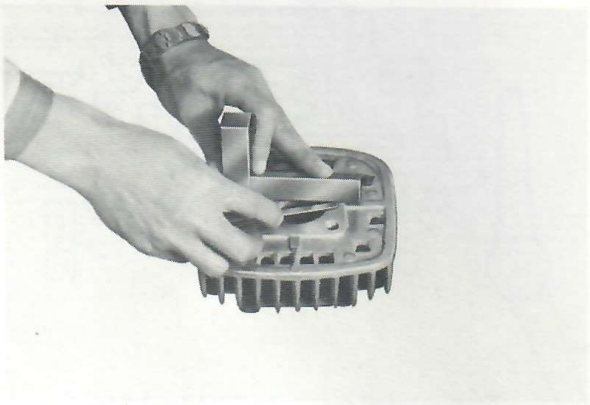


Fig. 7–5–25 Checking cylinder head warpage

C. Installing

Place cylinder head gasket between the cylinder head and cylinder and fit the cylinder head with 4 nuts.

Tighten them diagonally just the same as when loosening. Be sure to fit a flat washer under the cylinder head nut.

Cylinder head nut tightening torque
200 ~ 250 kg-cm (14.47 ~ 18.09 lb-ft)

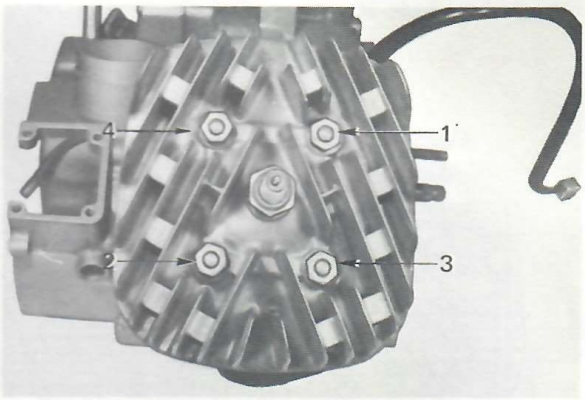


Fig. 7–5–26 Tightening cylinder head nuts

2. Cylinder

A. Servicing

Carbon deposits accumulated around the exhaust port increase resistance to the passage of exhaust gas and cause loss in engine power and engine overheating.

Remove carbon deposits every 6,000 km (4,000 mi) with a scraper or screw driver.

Be careful not to scratch or score the cylinder wall or passage surface.

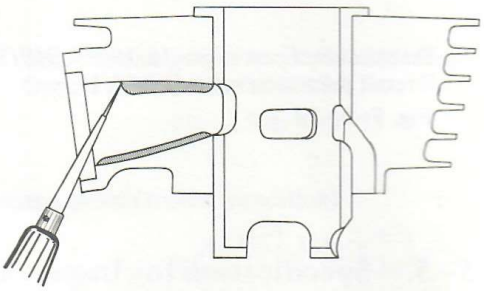


Fig. 7–5–27 Removing carbon deposits

B. Inspecting

Check the cylinder for wear. To determine the amount of wear, measure the cylinder bore with a cylinder gauge.

Measure the cylinder bore from front to back and from side to side at three points as shown figure. If the figure obtained by subtracting the smallest measurement from the largest one is over 0.05 mm (0.002 in) rebore the cylinder.

Fig. 7–5–28 Measuring cylinder bore

When refinishing the cylinder to oversize, first add to the standard cylinder bore size the oversize step. Before starting to measure the bore, it is apparently required to clean up the bore. This gives the exact size to which the cylinder should be refinished. Check carefully with an accurate cylinder gauge to get the exact size to be rebored. If this is accurately done, an oversize piston will fit with normal clearance. Oversize pistons are provided in 0.5 mm (0.02 in) and 1.0 mm (0.04 in) sizes.

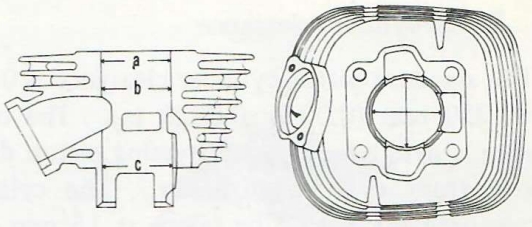


Fig. 7–5–29

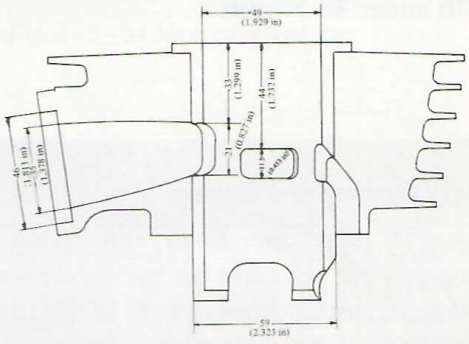


Fig. 7–5–30

Standard cylinder bore (measured at 15 mm below top surface)	49.000–49.015 mm (1.929–1.930 in)

It must be noted that the edges of the ports need to be rounded after reboring the cylinder.
If they are not rounded, rapid wear of the piston rings and unpleasant cylinder noise with result. Round the edges with a hand grinder or file according to the dimensions prescribed in the illustration.

Installing

Place the cylinder base gasket and install the cylinder over the piston and four stud bolts seeing that all the piston rings are in the right position and then tighten four fitting nuts. Application of motor oil over the piston rings will fit the cylinder easily. Use new cylinder base gasket each time the cylinder are removed. Depress the kick starter lever to check the piston movement after it is installed.

3. Piston

A. Servicing

Remove carbon deposits from the top and piston ring grooves with a knife or tip of an old piston ring. Carbon deposits on the top increase compression and cause engine overheating and those in the piston ring grooves cause the piston rings to become stiff and seize, causing compression leakage.

B. Piston-cylinder clearance

The standard piston-cylinder clearance is 0.040 ~0.050 mm (0.0016~0.0020 in). The clearance is determined by subtracting piston diameter from cylinder diameter. The cylinder measurement should be taken at 15 mm (0.6 in) below the top surface and the piston measurement at 20 mm (0.787 in) above the piston skirt 90° from the piston pin holes. Replace the piston with a new one when it has worn to under 48.85 mm.

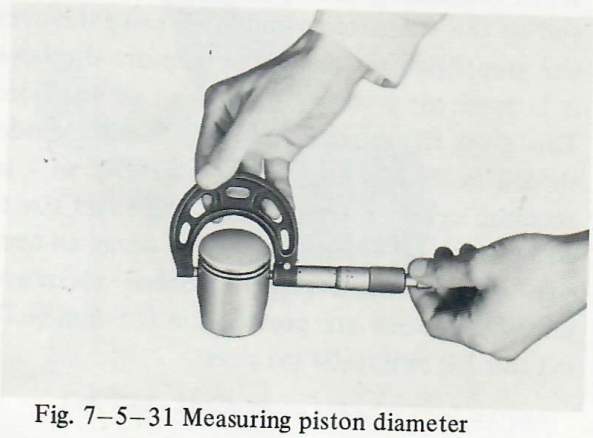


Fig. 7–5–31 Measuring piston diameter

	Standard	Limit
Clearance	0.040~0.050 mm (0.0016~0.0020 in)	0.25 mm (0.010 in)

C. Checking wear and damage

Inspect the piston pin holes and piston ring locating pins for wear and the piston surface for burned spots, piston rings to turn in the grooves and possibly catch on the ports of the cylinder. If the piston has burned spots or scratches on its surface, cylinder noise is produced and engine rotation becomes unsmooth, resulting in loss of engine power. Further, the piston is apt to seize on these points. Replace if badly worn and repair burns or minor defects with #400 emery paper.

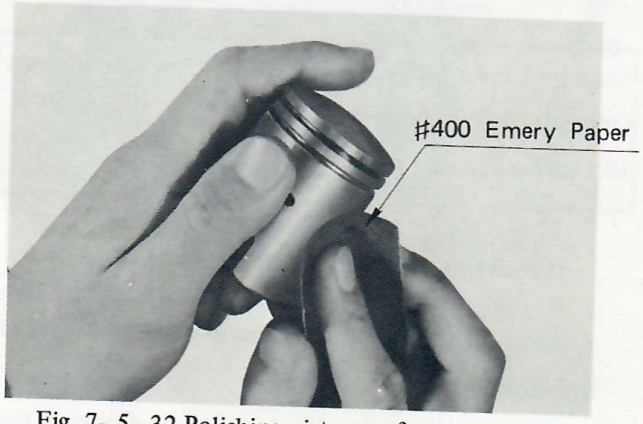


Fig. 7–5–32 Polishing piston surface

4. Piston Rings

The piston rings on this engine are of keystone type and tapered 7° on the upper surface. The most outstanding advantage of keystone type ring is to prevent carbon from accumulating on the upper and lower surfaces of the ring grooves on the piston and thus prevents ring sticking. Both the top and second rings are chrome plated for higher resistance to wear and they are interchangeable with each other.

A. Inspecting

Measure the end gap to check the piston rings for wear. To measure the end gap, first insert the ring into the lower part of the cylinder, where wear is the smallest, and then put a feeler gauge in the end gap. Use a piston to insert the piston ring into the cylinder so that the ring is fitted square with the cylinder.

Fig. 7–5–33 Inserting piston ring into cylinder

B. Installing

Before installing the piston rings clear the ring grooves of the piston and piston rings of any foreign particles.

Fit the stamped mark side-up. Be sure to turn the rings in the grooves after installing them. If they do not turn smoothly, it indicates that foreign particles still exist.

Take the piston rings out of the grooves again and remove the foreign particles. Although the top and second rings are quite the same, be careful to fit them in the same groove as before in order to maintain mated condition in case used piston rings are reinstalled.

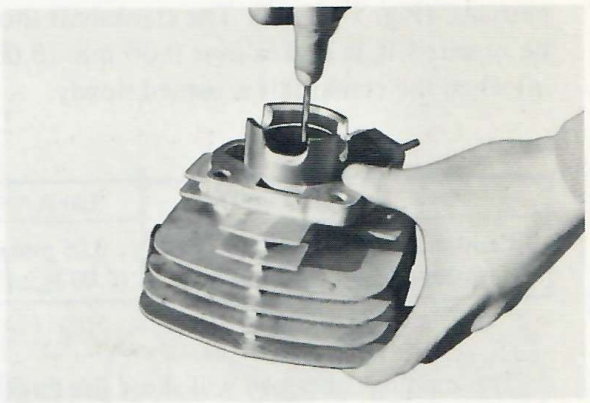


Fig. 7–5–34 Measuring end gap

Fig. 7–5–35 Checking side clearance

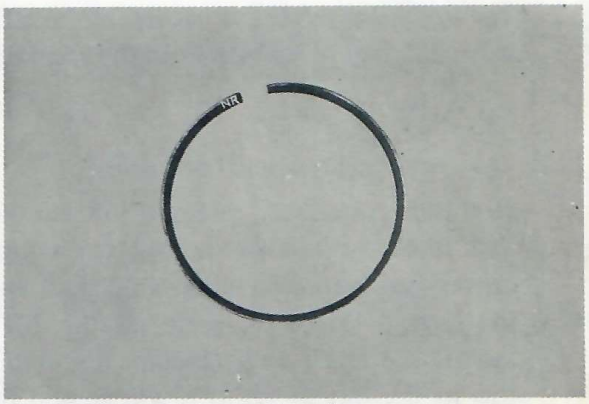


Fig. 7–5–36 Stamped mark

5. Crankshaft

The crankshaft changes the up-and-down motion of the piston to circular motion to turn the rear wheel through the gearbox, sprockets and drive chain. The crankshaft assembly installed in the TS100 and TC100 engine consists of crank wheels, connecting rod and crank pin. The right and left crank wheels are unit-constructed with journals and combined with each other by the crank pin. On the left wheel is installed an oil guide plate which guides the oil passing through the left crankshaft bearing to the crankpin. The crankshaft assembly is supported by three ball bearings which are shrink-fitted in the crankcase and positively lubricated by the oil supplied under pressure from the oil pump.

A needle bearing is installed on both the large and small ends of the connecting rod, assuring smooth turning and minimum wear.

Inspecting, adjusting and repairing;

A. Crankshaft shake

If the crankshaft is not centered properly and shakes excessively, wear of the crankshaft bearings, piston, cylinder and piston pin are hastened. Measure the crankshaft shake and adjust. To measure the crankshaft shake place the crankshaft on a V-block or a crankshaft measuring jig.

The crankshaft shake should be measured with a dial gauge on right and left crankshaft journals. (Fig. 7–5–38) The crankshaft should be repaired if it shakes over 0.06 mm (0.0023 in) when the crankshaft is turned slowly.

	Standard	Limit
Crankshaft shake	below 0.06 mm (0.0024 in)	0.06 mm (0.0024 in)

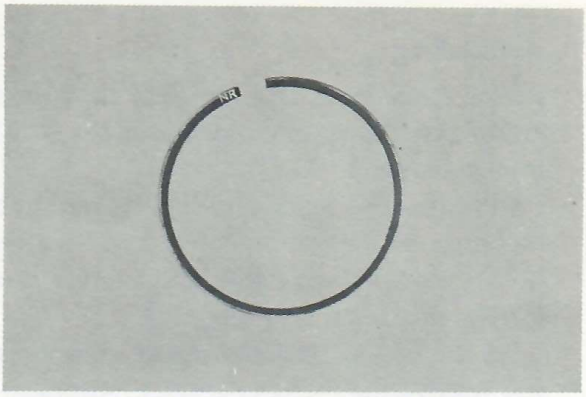


Fig. 7–5–37 Checking crankshaft shake

The readings obtained will show the direction in which the wheels are out of truth. Lay the crankshaft assembly on the V-block and with a copper mallet give shaking wheels a light tap in the required direction. Again check the shake. Continue this work until the reading of the dial gauge is below 0.06 mm (0.0024 in).

The crankshaft shake is caused by insufficient tightness between the crank pin and crank wheels worn bearings or stress put on the crankshaft when assembling the crankcase.

B. Connecting rod small end shake

Rest the crankshaft assembly on the V-block and place the connecting rod at its top dead center position where the crankshaft shake is the largest. Place the feeler of the dial gauge against the small end. Incline the connecting rod to the left as far as it will go and then to the right and measure the connecting rod small end shake. (Fig. 7–5–39)

If the reading obtained is over 3 mm (0.118 in) repairing is required.

Limit of small end shake	3 mm (0.118 in)

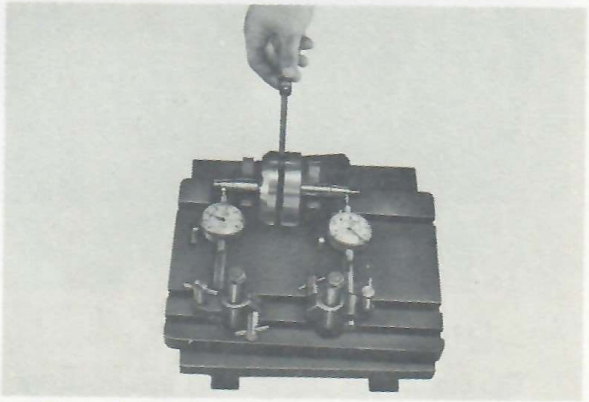


Fig. 7–5–38 Checking con-rod small end shake

The connecting rod shake is caused by worn large end eyes, crank pins, large end needle bearing etc. Disassemble the crankshaft by using disassembling jigs and a press and replace worn parts with new ones. When reassembling the crankshaft, apply oil to all joining sections and use specially designed assembling jigs and a press. After reassembling the crankshaft be sure to check the crankshaft shake and repair if necessary.

6. Clutch

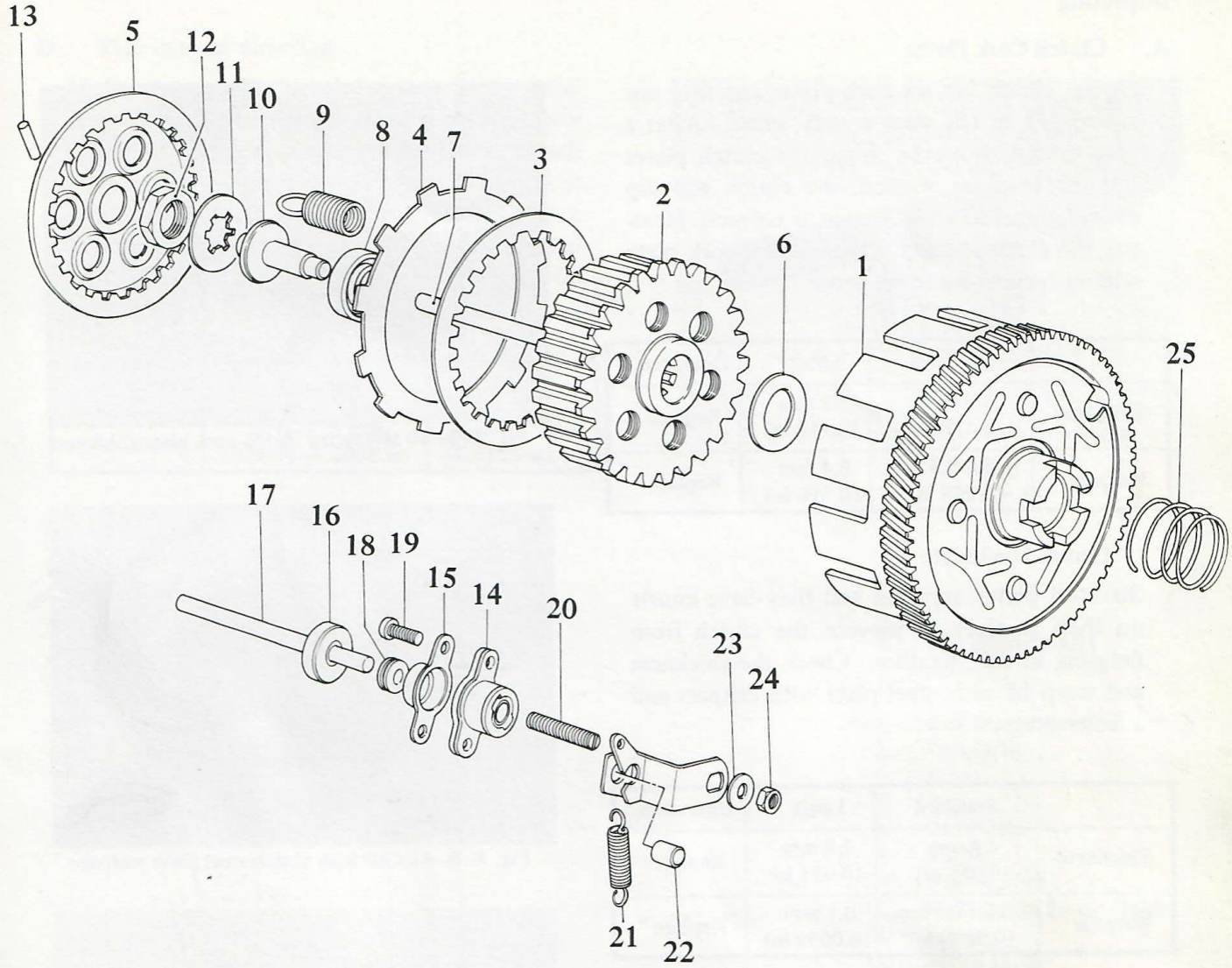


Fig. 7–5–39 Exploded view of TS100/TC100 clutch

1.	Primary Drive Gear Ass'y	9.	Clutch Spring	18.	Clutch Release Screw Dust Seal
2.	Clutch Sleeve Hub	10.	Clutch Pushpiece	19.	Clutch Release Screw Guide Screw
3.	Clutch Steel Plate	11.	Clutch Sleeve Hub Washer	20.	Clutch Release Adjust Screw
4.	Clutch Cork Plate	12.	Clutch Sleeve Hub Nut	21.	Clutch Release Return Spring
5.	Clutch Pressure Plate	13.	Clutch Spring Pin	22.	Release Arm End Piece
6.	Clutch Sleeve Hub Thrust Washer O.D=29, I.D=17, T=1.5	14.	Clutch Release Screw	23.	Washer
		15.	Clutch Release Screw Cover	24.	Nut
7.	Push Rod	16.	Push Rod Oil Seal	25.	Primary Drive Gear Spring
8.	Clutch Pushpiece Oil Seal	17.	Push Rod		

The clutch is an important part of the engine, situated between the crankshaft and transmission gears. The clutch transmits or breaks the engine power to the gears. The clutch mounted on this engine consists of five cork plates and steel plates, clutch housing and sleeve hub are submerged in motor oil in the clutch chamber.

This type of clutch is called a wet multi-plate clutch.

Inspecting

A. Clutch Cork Plates

As the clutch has six cork plates and they are submerged in oil, wear is very small. After a long period, however, when the clutch plates become worn or warped, the clutch will slip even if the clutch adjustment is correct. Measure the thickness and warp of each cork plate with calipers and a feeler gauge.

	Standard	Limit	Operation
Thickness	3.0 mm (0.118 in)	2.8 mm (0.110 in)	Replace
Warpage	under 0.4 mm (0.016 in)	0.4 mm (0.016 in)	Replace

Fig. 7–5–40 Measuring clutch cork plate thickness

B. Clutch Steel Plate

Six steel plates are used and they have knurls on their surfaces to prevent the clutch from dragging in cold weather. Check the thickness and warp of each steel plate with calipers and a feeler gauge.

	Standard	Limit	Operation
Thickness	1.4 mm (0.055 in)	1.3 mm (0.051 in)	Replace
Warpage	under 0.1 mm (0.0039 in)	0.1 mm (0.0039 in)	Replace

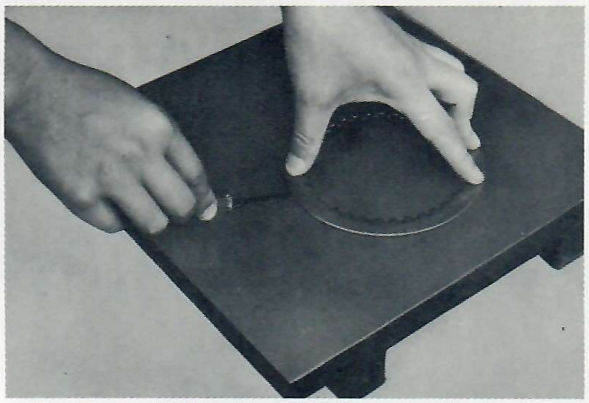


Fig. 7–5–41 Checking clutch steel plate warpage

C. Clutch Spring

The clutch springs which have lost their tension also cause clutch slipping resulting in loss of power and rapid wear of the clutch plates. Remove the clutch springs from the clutch sleeve hub by turning them out by hand and measure their free length with calipers.

	Standard	Limit	Operation
Free length	30.2 mm (1.1890 in)	31.2 mm (1.228 in)	Replace

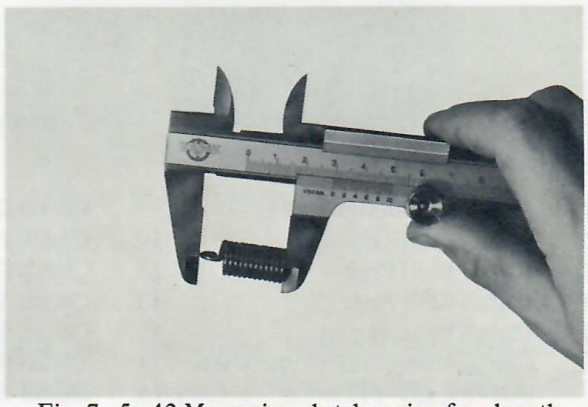


Fig. 7–5–42 Measuring clutch spring free length

When refitting the clutch springs, make sure that their bottom ends align with the clutch sleeve hub bottom surface and do not protrude. Use a square to check the clutch spring fitting.

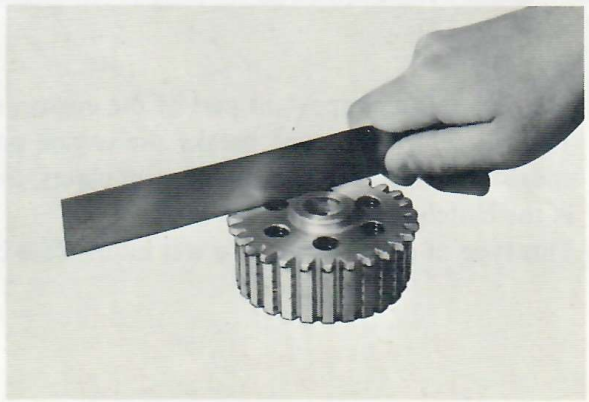


Fig. 7–5–43 Repairing clutch sleeve hub

D. Play in axial direction

If the play of the clutch housing in the axial direction becomes large, rattling noise is produced. Check the play after fitting the clutch housing on the countershaft as follows. First tighten the clutch sleeve hub, and then check it by moving the primary gear toward the axial direction after fitting the dial gauge feeler on the surface of the clutch housing.

	Standard	Limit
Axial play	0.1~0.25 mm (0.0039~0.0098 in)	0.3 mm (0.0118 in)

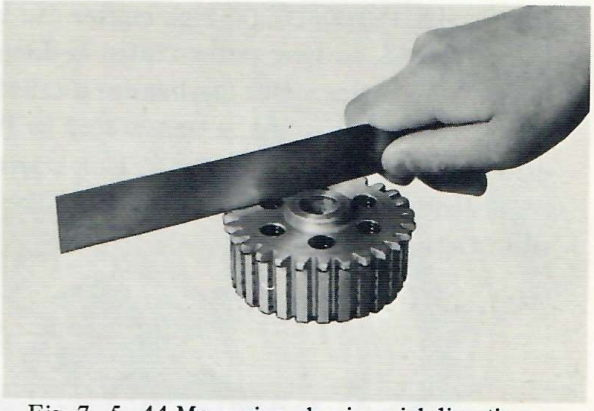
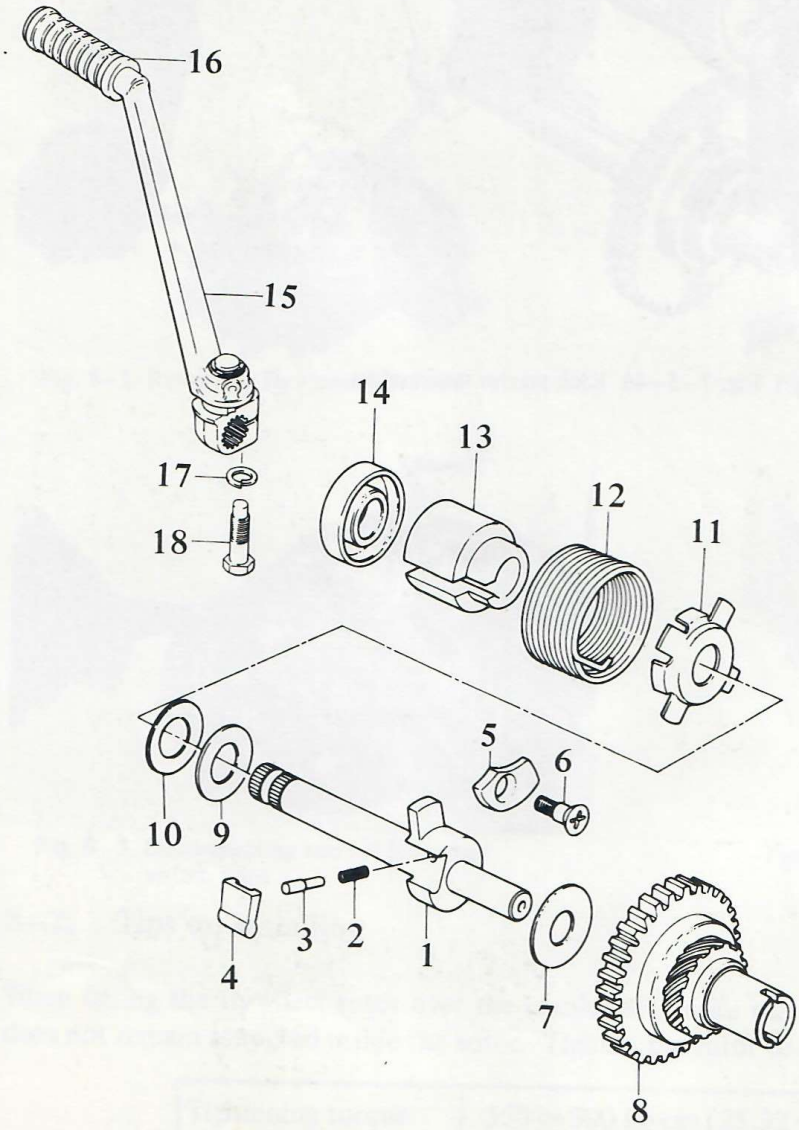


Fig. 7–5–44 Measuring play in axial direction

7. Kick

Exploded view of kick system



1. Kick Starter Shaft
2. Spring
3. Pin
4. Kick Starter Pawl
5. Paul Lifter
6. Screw
7. Washer
8. Drive Gear
9. Washer
10. Wave Washer
11. Kick Starter Spring Holder
12. Spring
13. Spring Guide
14. Oil Seal
15. Kick Starter Lever Ass'y
16. Rubber
17. Lock Washer
18. Bolt

Fig. 7–5–45 Exploded view of kick system

Description

The model TS100/TC100 kick starter can be operated by pulling in the clutch lever even with the gears engaged, so long as the clutch is disengaged. It is not necessary to shift into neutral before starting the engine. This mechanism is called a primary kick starting system.
The kick starting action is transmitted to the engine in the order of kick starter shaft, kick starter drive gear, kick starter idle gear, kick starter driven gear, primary driven gear, primary drive and crankshaft, as shown in Fig. 7–5–46. The engine can be started regardless of gear position if the clutch is disengaged.

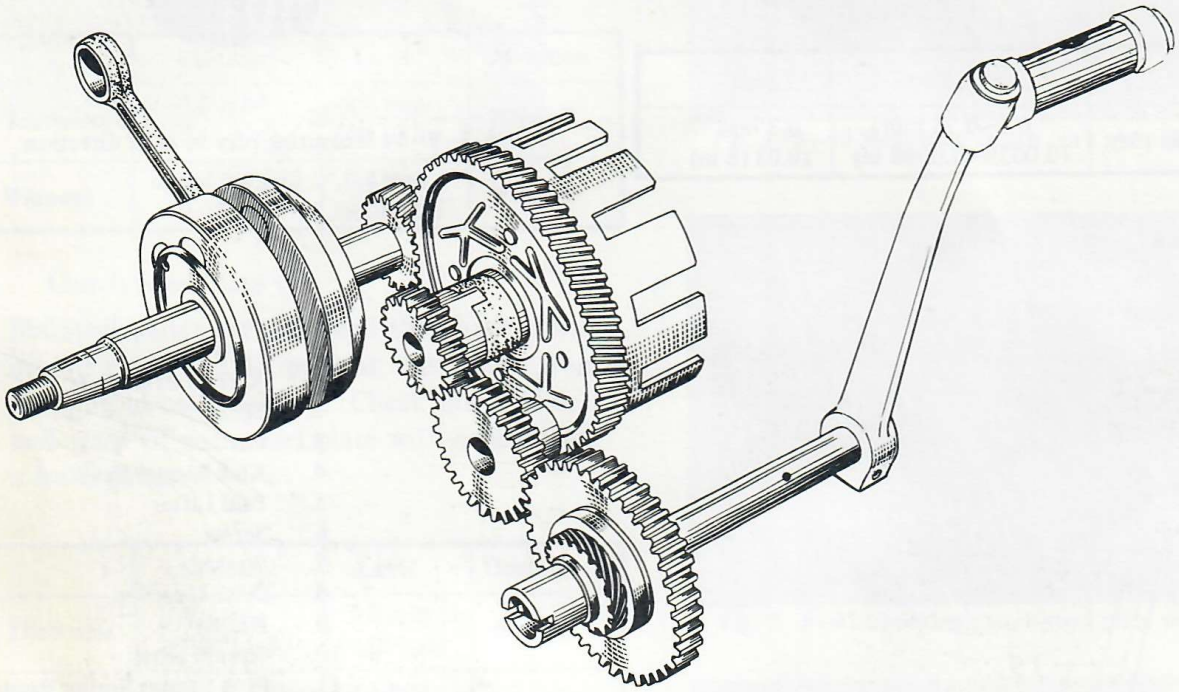
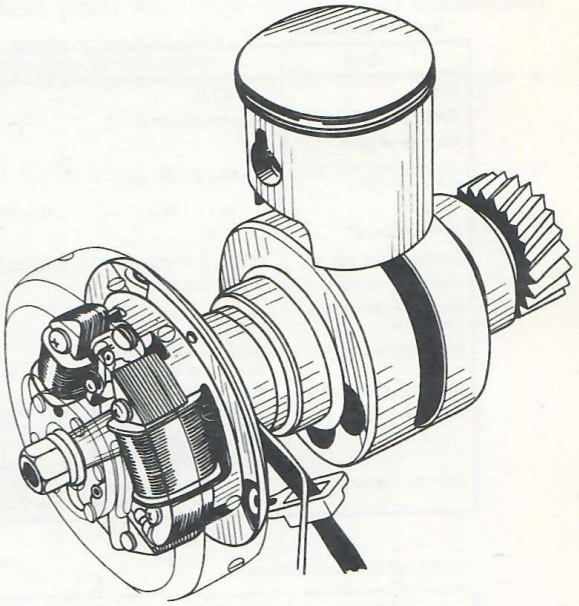


Fig. 7–5–46 Kick starter mechanism

8. ENGINE ELECTRICAL EQUIPMENT

Construction and operation of flywheel magneto



When the magneto is turned in accordance with engine revolution, a voltage is generated in the magneto. The induced voltage is transformed into high voltage by the ignition coil and contact breaker points causing a spark in the spark plug.
The magneto used on the model TS100/TC100 is called a flywheel magneto as the magnets serve as a flywheel for the crankshaft as well as a rotor.
In addition to this, this flywheel magneto has lamp coils to charge the battery and to light the head lamp and tail lamp during night riding.

8–1. Removing

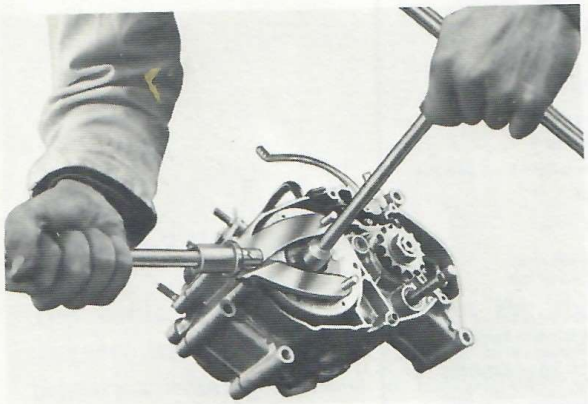


Fig. 8–1 Removing flywheel rotor nut

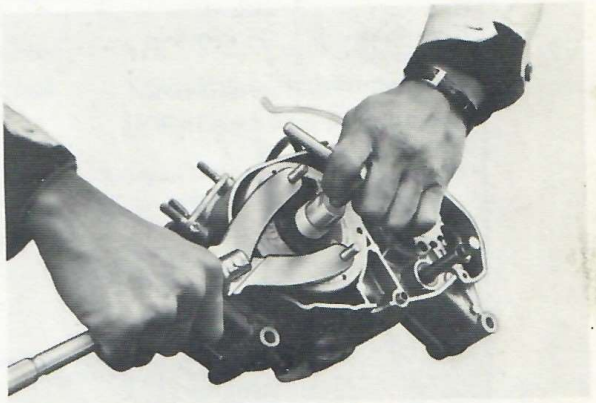


Fig. 8–2 Removing flywheel rotor

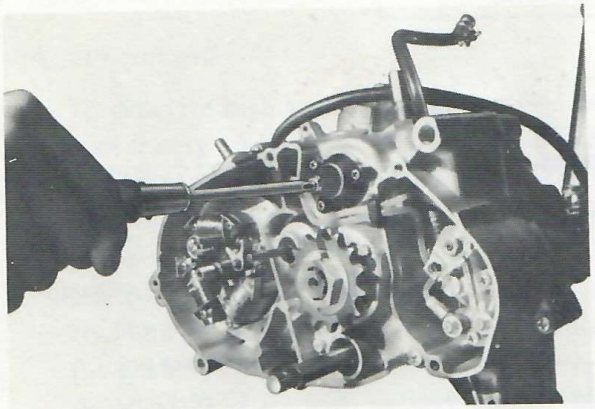


Fig. 8–3 Disconnecting neutral indicator switch wire

Fig. 8–4 Removing magneto stator

8–2. Tips on installing

When fitting the flywheel rotor over the crankshaft, make sure that any iron piece or foreign matter does not remain attracted inside the rotor. Tighten the rotor to the following tightening torque.

Tightening torque	350 ~ 500 kg-cm (25.32 ~ 36.16 lb-ft)

8–3. Specifications of flywheel magneto

* Standard specification

ITEM	NIPPON DENSO 32100–25010	KOKUSAN DENKI 32100–25020
Type	AMKC-01	FA6311
Turning direction	Counterclockwise	Counterclockwise
Number of poles	6	6
Air gap (gap between rotor and coils)	0.5 mm (0.020 in.)	0.4 mm (0.016 in.)
Weight	1.5 kg (3.3 lbs.)	1.5 kg (3.3 lbs.)
Ignition timing	20° ± 2°	20° ± 2°
Contact point gap	0.30 – 0.40 mm (0.012 – 0.016 in.)	0.30 – 0.40 mm (0.012 – 0.016 in.)
Condenser capacity	0.16 – 0.20 μF	0.16 – 0.20 μF
Condenser insulation resistance	Over 100 MΩ	Over 500 MΩ
Spark performance	Over 7 mm at 500 rpm, Over 8 mm at 3,000 rpm.	Over 7 mm at 500 rpm, Over 8 mm at 3,000 rpm.
Charging performance	DAY TIME: Over 0.1 A at 2,000 rpm. (V_B=7.5±0.1V) Below 3.2 A at 8,000 rpm. (V_B=8.7±0.1V) NIGHT TIME: 0.5 A at 8,000 rpm.	DAY TIME: Over 0.1 A at 2,000 rpm. Below 3.2 A at 8,000 rpm. NIGHT TIME: 0.5 A at 8,000 rpm.
Lighting capacity	Over 6 V at 2,000 rpm. (V_B=7.5±0.1 V) Below 8.5 V at 8,000 rpm. (V_B=7.5±1 V)	Over 6 V at 2,000 rpm. Below 8.5 V at 8,000 rpm.

* USA and Canada specification

ITEM	NIPPON DENSO 32100–25611	KOKUSAN DENKI 32100-25691
Type	AMKC-02	FP6105
Turning direction	Counterclockwise	Counterclockwise
Number of poles	6	6
Air gap (gap between rotor and coils)	0.5 mm (0.020 in.)	0.4 mm (0.016 in.)
Weight	1.5 kg (3.3 lbs.)	1.5 kg (3.3 lbs.)
Ignition timing	20° ± 2°	20° ± 2°
Contact point gap	0.30 – 0.40 mm (0.012 – 0.016 in.)	0.30 – 0.40 mm (0.012 – 0.016 in.)
Condenser capacity	0.16 – 0.20 μF	0.16 – 0.20 μF
Condenser insulation resistance	Over 100 MΩ	Over 500 MΩ
Spark performance	Over 7 mm at 500 rpm, Over 8 mm at 3,000 rpm.	Over 7 mm at 500 rpm, Over 8 mm at 3,000 rpm.
Charging performance	DAY TIME: (G) 0.6 A at 2,000 rpm. 2.2 A at 8,000 rpm. (G/W) Starts to charge below 3,000 rpm. Below 3.2 A at 8,000 rpm. NIGHT TIME: Over 0.5 A at 2,000 rpm. Below 3.2 A at 8,000 rpm.	DAY TIME: (G) Starts to charge below 1,400 rpm. 3.4 A ± 0.5 A at 8,000 rpm. (G/W) Starts to charge below 3,000 rpm. 2.5 A ± 0.5 A at 8,000 rpm. NIGHT TIME: Starts to charge below 2,000 rpm. Over 2 A at 8,000 rpm.
Lighting performance	Over 6 V at 2,500 rpm.(V_B=8.3±0.1 V) Below 9 V at 8,000 rpm. (V_B=8.7±0.1 V)	Over 6 V at 3,000 rpm. Below 8.7 V at 8,000 rpm.

Wiring diagram

When checking performance, connect the electrical equipment in accordance with wiring diagram.

Wiring Diagram

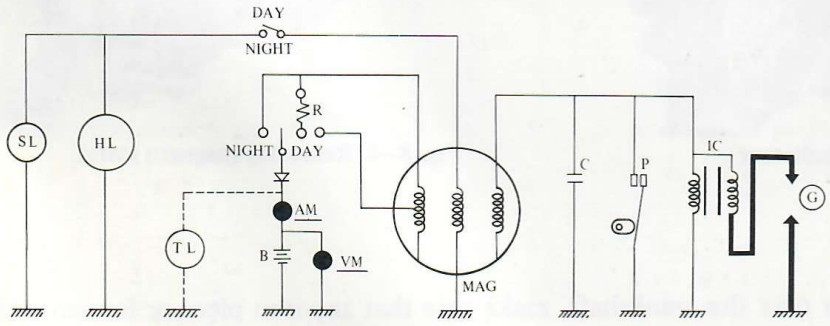
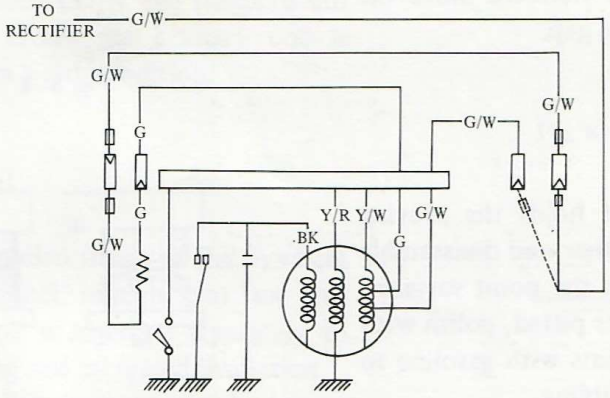


Fig. 8–5

MAG : Flywheel magneto
IC : Ignition coil
P : Contact point
C : Condenser
SL : Speedometer lamp
HL : Headlamp
TL : Tail lamp
AM : DC Ammeter
VM : DC Voltmeter
G : Three prolong gap tester

The flywheel magnetos of Nippon Denso and Kokusan Denki make are used on the model TS100/TC100. If it becomes necessary to replace the component parts with new one such as condenser, contact points and each coil, the use of the same brand of parts is inevitable.
In regard to the ignition coil also, the use of parts of the same brand as flywheel magneto is recommended.

When the battery is apt to over-charge, disconnect the G/W lead wire with color tube and then connect the G/W lead wire without color tube as shown below.



G : Green
BK: Black
Y/R: Yellow with Red tracer
Y/W: Yellow with White tracer
G/W: Green with White tracer

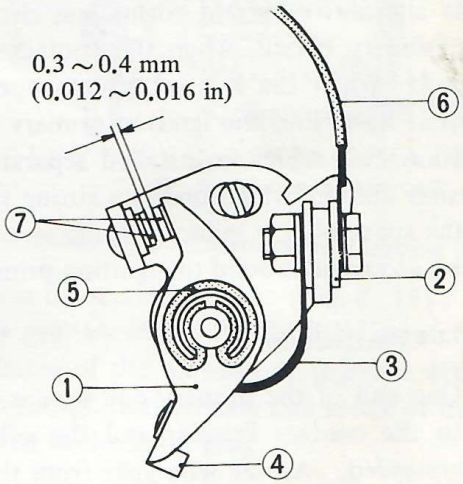
Fig. 8–6

8–4. Contact breaker

The contact breaker installed on the flywheel magneto stator is a kind of switch which cuts the primary current generated in the primary coil by the action of a rotating cam inside the flywheel rotor.

A. Point gap

To generate high voltage in the ignition coil, it is necessary to interrupt the flow of current in the primary coil, and the flow of the current is interrupted when the contact points just open. If the point gap is too small, the current is not interrupted completely because of the flying ark, and if too large, the absolute quantity of the primary current decreases.
As in both cases high voltage cannot be produced, the standard contact point gap should be 0.3 ~ 0.4 mm (0.012 ~ 0.016 in).
To measure the gap, use the thickness gauge which is fitted to the contact point wrench.



1 Contact breaker arm
2 Insulator
3 Spring
4 Cam follower
5 Circlip
6 Wire from primary coil
7 Contact breaker points

Fig. 8–7 Contact breaker

B. Adjusting

If the contact point gap is larger than standard, loosen the screw (a) shown in Fig. 8–8. Insert a screw driver in slot (b) located on the contact base and move the base to the right to adjust the gap to the standard.
If the gap is smaller than standard move the base to the left to adjust the gap.

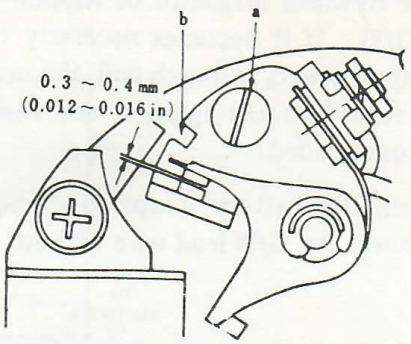


Fig. 8–8 Point gap adjustment

C. Inspecting

1. Point surfaces

Remove the circlip which holds the moving point and fixed point together and disassemble the contact points. Inspect the point surfaces. If the surfaces are burned or pitted, polish with an oil stone. Wash the points with gasoline to remove any oil before assembling.

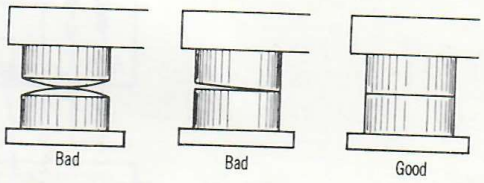


Fig. 8–9 Contact point condition

8–5. Primary Coil

The primary coil is fitted to the stator of the flywheel magneto and an electromotive force is induced in the coil when the flywheel rotor turns. Electric current induced is alternative current. This alternative current forms one circuit, called the primary circuit, when the contact points are closed. When the contact points open, electric current flows into the ignition primary coil in the ignition coil, which is installed separately. High tension current which makes a strong spark jump in the spark plug is induced in the secondary coil, which is wound around the ignition primary coil.

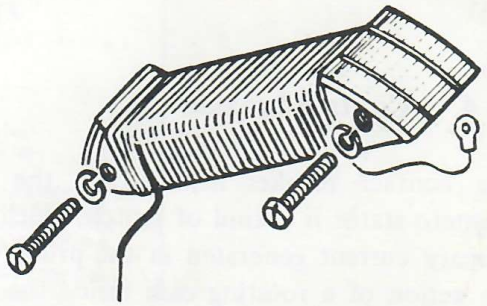


Fig. 8–10 Primary coil

A. Construction

One end of the primary coil wire is connected to the contact breaker and the other end is grounded. A blue wire goes from the primary coil to the condenser and then to the contact breaker. A black/yellow wire connects with this wire at the condenser and leads to the ignition primary coil.

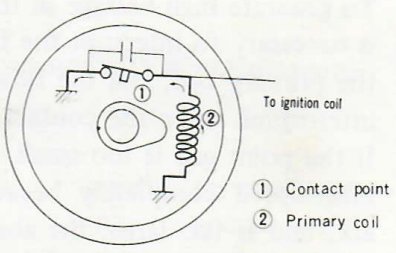


Fig. 8–11 Electric current flow with contact points closed

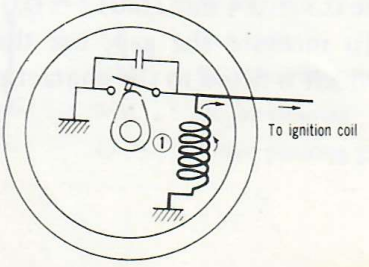


Fig. 8–12 Electric current flow with contact points open

B. Inspecting

Check conductivity and resistance of the primary coil using Suzuki pocket tester as shown in Fig. 8–13. Standard resistance is 1 ~ 2 Ω.

Note: As the resistance is small, a very precise test meter is required. If the test result is not exactly the standard but is pretty close, the primary coil is probably in good condition.

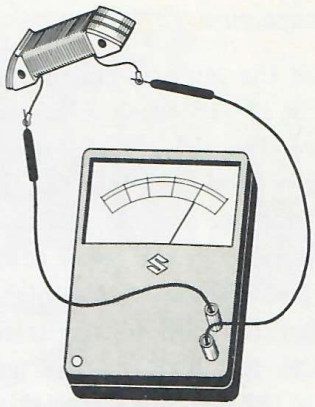


Fig. 8–13 Checking primary coil

8–6. Ignition Coil

The ignition coil is installed inside of the flywheel magneto on conventional models but on this model the ignition coil is installed separately to obtain excellent cooling and increased insulation. At the same time by this arrangement the layout of the parts leaves enough space so the life of coils is prolonged.

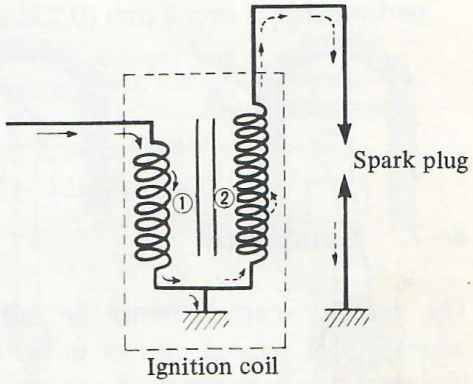
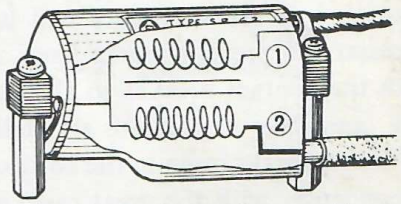


Fig. 8–14 Wiring of ignition coil

A. Construction

The ignition coil is a kind of transformer which transforms low voltage electric current into high voltage current. The ignition coil consists of two windings. Comparatively thick enamelled copper wire about 0.5 mm (0.01969 in) in diameter is wound around the iron core about 370 times and thin enamelled copper wire approximately 0.06 mm (0.00236 in) in diameter is wound around the core about 20,000 times.



1 Ignition primary coil
2 Ignition secondary coil

Fig. 8–15 Construction of ignition coil

The first coil is called the ignition primary coil and the other is the secondary coil. (Fig. 8–15) One end of the ignition primary coil wire is connected to the primary coil of the flywheel magneto (black/yellow harness) and the other is grounded to the frame of the motorcycle together with the iron core. One end of the secondary coil is connected to the ignition primary coil inside of the ignition coil and the other end (high tension cord) is connected to the spark plug.

B. Operation

When electric current generated in the primary coil of the magneto by the turning of the flywheel is cut by the contact breaker, electric current of approximately 300 volts is induced. This electric current flows momentarily into the ignition primary coil and high voltage electric current of from 13,000 to 20,000 volts is produced in the secondary coil.

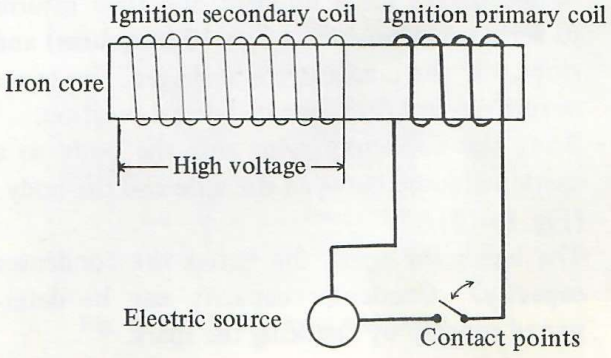


Fig. 8–16 Ignition coil operation

C. Inspection

Check the ignition coil performance as shown in Fig. 8–15 using a battery as the electric source for the electro tester. Connect the primary coil terminal to the tester primary side positive terminal and the ignition coil fitting stay to the tester primary side negative terminal. Connect the high tension cord of the ignition coil to the tester secondary side positive terminal and the ignition coil fitting stay to the negative terminal. Use a three prong gap to check. (Fig. 8–17) Standard spark performance is over 7 mm (0.236 in).

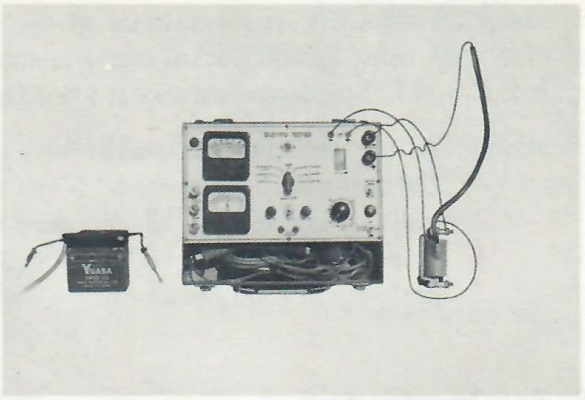


Fig. 8–17 Checking ignition coil sparking performance

8–7. Condenser

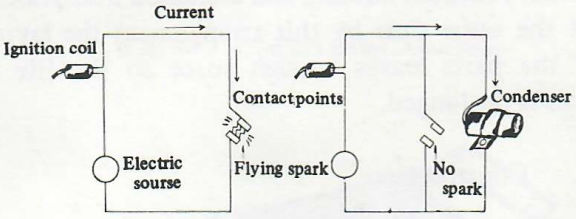


Fig. 8–18 Electric current flow

The primary current must be cut rapidly to generate high tension current in the ignition coil. If a spark arcs between the contact breaker points, fluctuation of the current is delayed and voltage generated in the secondary coil is reduced. It is necessary to prevent sparks from arcing in the contact points. A condenser is connected in parallel with the contact breaker to absorb electric energy and keep it from sparking in the contact breaker. The condenser capacity is its ability to absorb and charge electric energy. If the capacity is not sufficient sparks jump in the contact breaker, burning the contact points.

A condenser with too great capacity causes poor spark performance in the spark plug. It is necessary to use a condenser with the proper capacity.

The condenser must have a capacity of 0.18 μF ± 10 %.

A. Inspection

Set the electro tester to the "insulation resistance" position. Touch the tester terminals to the condenser terminal and the body. The condenser is in good condition if the tester needle shakes for a moment and then returns to its normal position (over 10 megohms) and stops. If the condenser is damaged, the tester needle will not return to its normal position.

Bring the condenser wire near the body so a spark will jump between the wire and the body. (Fig. 8–17)

The larger the spark the better the condenser capacity. Condenser capacity can be determined roughly by checking the spark.

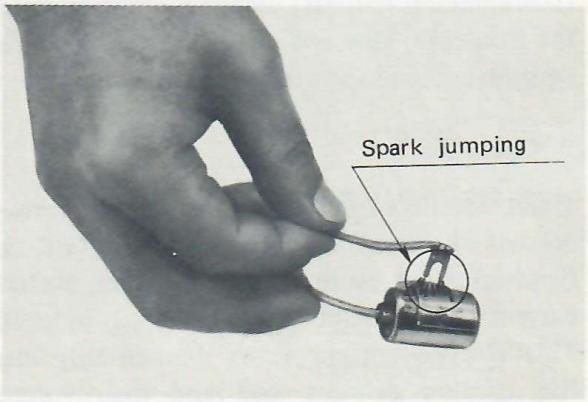


Fig. 8–19 Condenser spark jumping

Set the electro tester to the "condenser capacity" position to measure capacity accurately. With the tumbler switch pulled down to "cal" position, align the tester needle with the standard capacity (μF) stamped on the identification plate which is attached to the side of the electro tester by turning the adjuster. Push the tumbler switch to "test" position and connect the inspection terminals to the condenser terminals. Standard condenser capacity is 0.18 μF.

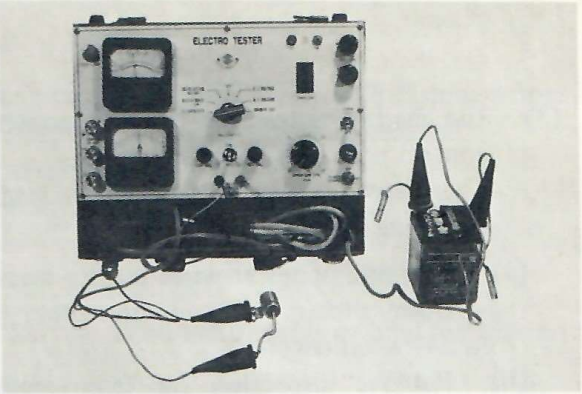


Fig. 8–20 Testing condenser capacity

8–8. Ignition Timing

Ignition timing is the most proper time to ignite the compressed gas in the compression process of the engine (on the upstroke of the piston), and is usually shown by the distance from T.D.C. down to the top of the piston when the contact points just begin to open. It is also shown by the crankshaft rotating angle (θ) before T.D.C.
Whether ignition is timed properly or not influences sensitively on the performance of the motorcycle. Improper ignition timing causes decrease in h.p., overheating and increase in fuel consumption, etc. and resultantly shortens the life of the engine. So, ignition should be timed correctly. The relation between piston distance (mm) and crankshaft angle of TS100 and TC100 is shown below.

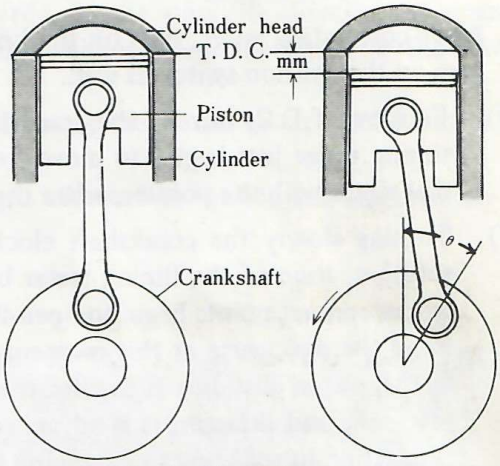


Fig. 8–21 Ignition timing

	← Timing retards			S T D	Timing advances →				
Piston distance (mm)	1.61	1.80	2.01	2.22 mm	2.44	2.68	2.92	3.17	3.44
Crank shaft angle	17°	18°	19°	20°	21°	22°	23°	24°	25°

A. Inspecting

Before checking ignition timing, be sure that contact point gap is set at 0.35 mm.

1. Checking with timing gauge and timing tester.

(1) Remove the spark plug and screw the timing gauge holder, with the timing gauge inserted in it, into the spark plug hole.

(2) The timing gauge should be set on the holder so that the movement of the piston may be clearly confirmed by the timing gauge, in the range of 5 mm before T.D.C.

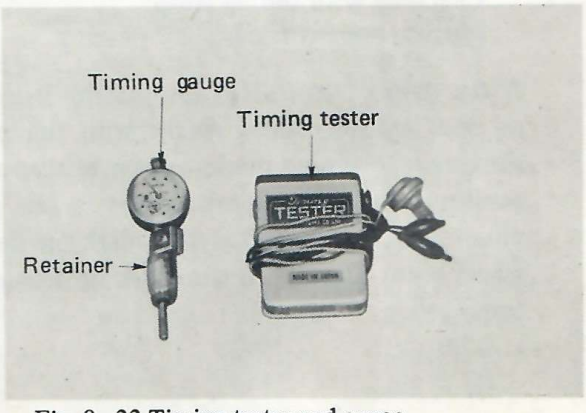


Fig. 8–22 Timing tester and gauge

(3) Use the timing tester to find the moment for contact points to begin opening.
There are two ways to connect the leadwires of timing tester.

(a) Clip one of tester wires on the blackwire from primary coil, and the other somewhere on engine.

(b) Remove inspection cap from crankcase left cover, and clip one of testerwires on contact arm spring, and the other somewhere on engine.

Fig. 8–23 Checking ignition timing with timing tester and gauge

After connecting wires, turn on the knob of tester. But when the latter way is applied, be sure to turn on the ignition switch as well.

(4) Find out T.D.C. turning the crankshaft slowly. T.D.C. is the position where the pointer of the timing gauge just begins to move from right to left. Adjust the knurled ring until "0" on the dial aligns with the pointer, when the piston is at T.D.C.

(5) Turning slowly the crankshaft clockwise, in other words, in the opposite direction of engine rotation, tone of the timing tester buzzer changes. These changes tell you the precise position where contact points begin to open-that is, ignition timing.
Read the dial gauge at this moment, and you will see in mm the piston distance before T.D.C. If the piston distance is smaller than the standard given in the table above, ignition timing is retarded, and if larger, it is advanced. In either case, adjust it to the standard by moving the contact point referring to paragraph C. "Adjusting"

B. 1. Checking with timing marks

Turn the flywheel rotor slowly to the left by hand and stop it when the contact points just begin to open. (Use the timing tester to find the position that the contact points just begin to open.) Check to see if timing mark on the crankcase aligned perfectly with timing mark on the flywheel. If the marks are aligned the ignition timing is correct. (Fig. 8–24 & 8–25).

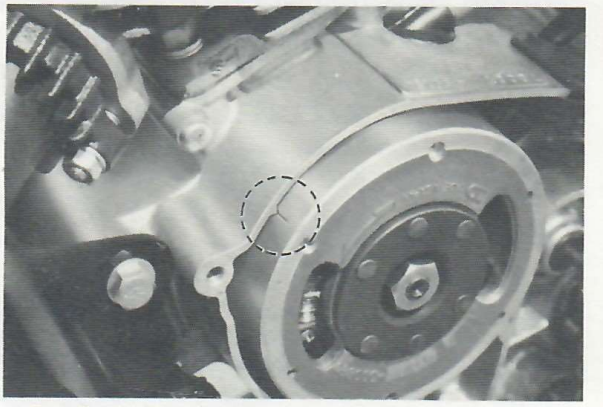


Fig. 8–24 Checking with timing marks

2. Checking with timing lamp
(Suzuki electro tester)

If the light of an electro tester lamp is thrown on the ignition timing marks with the engine running, the timing marks appear to stop at the position where the spark jumps in the spark plug. Check to see that the mark on the flywheel rotor align with the mark on the crankcase.

Fig. 8–25 Checking with timing light

C. Adjusting

If it is found on the inspection of the ignition timing that the piston is not at 2.22 mm before T.D.C. or the timing marks are not aligned, the engine cannot develop its top performance.
So it is necessary to check and adjust the timing periodically.
TS100 and TC100 ignition timing can not be adjusted by rotating flywheel magneto stator. It can be adjusted only by the contact point gap.

1. Adjusting with timing gauge and timing tester.

Remove the inspection cap from engine left cover. Set the same instruments as used for ignition timing inspection.
Find out T.D.C. by turning the crankshaft slowly. T.D.C. is the position where the pointer of the timing gauge just begins to move from right to left and vice versa. Adjust the knurled ring until "0" on the dial aligns with the pointer under such a condition that the piston is at T.D.C.
Turning slowly the crankshaft clockwise in other words, in the opposite direction of engine rotation, make sure that tone of the timing tester buzzer changes and the lamp on the tester goes out.
Adjust the point gap so that the tone of buzzer changes when the piston on up-stroke comes to the distance of 2.22 mm (0.087 in) from T.D.C.
In case the point gap is 0.35 mm, the ignition timing is adjusted to the standard (2.22 mm by piston distance) as a rule.

8–9. Charging System

8–9–1. Description

Two lamp coils are fitted along with the primary coil on the flywheel magneto stator and generates alternative current electricity when the flywheel rotor turns. This current is supplied to the head lamp, etc., and is changed into direct current by the rectifier to charge the battery.

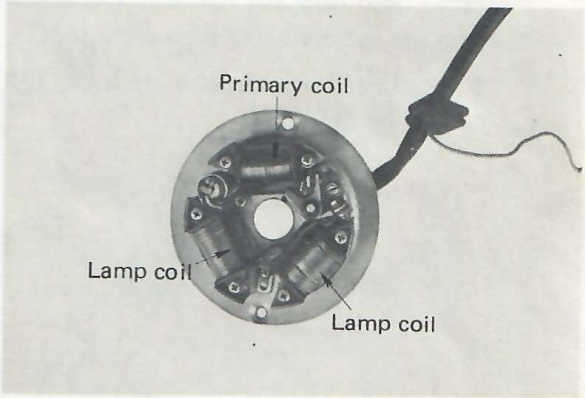


Fig. 8–26 Coils

8–9–2. Lamp coil

The coil ① is fine and others are thick. In day time, coils ① and ② are used to charge battery. In night time, coils ② and ③ operate for battery charge and lamps.

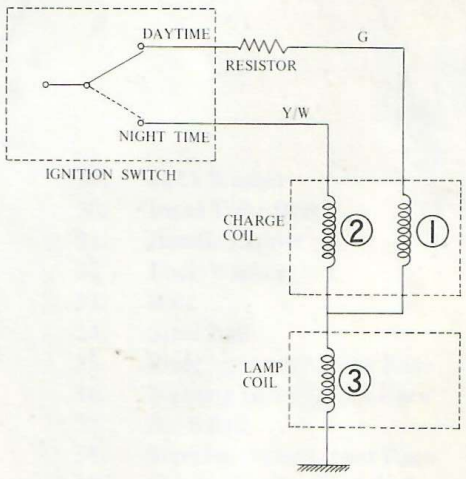


Fig. 8–27 Wiring

8–9–3. Rectifier

The rectifier converts alternative current into direct current. It allows electric current to pass through it freely in one direction but nearly perfectly prevents current from flowing through it in the opposite direction.

A. Rectifier check

Connect the Suzuki Pocket Tester (+) lead to the rectifier (+) terminal, and (–) lead to the rectifier (~) terminal as shown in Fig. 8–28.
Switch the tester to the lower resistance check range (R X 1), and note the reading. Good rectifier will give the indication of low resistance.

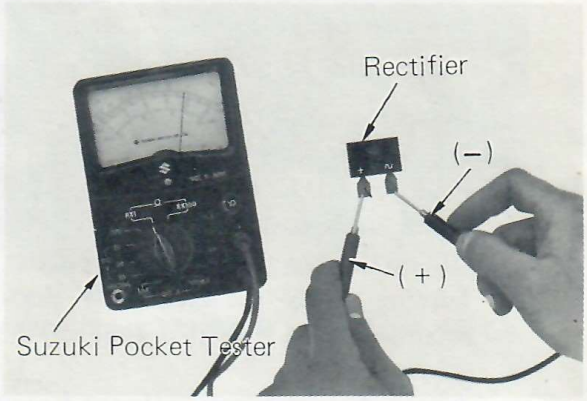


Fig. 8–28 Normal direction (Current flows)

Connect the tester (+) lead to the rectifier (~) terminal, and (–) lead to the rectifier (+) terminal as shown in Fig. 8–29.
Switch the tester to the lower resistance check range, and note the reading. Good rectifier will give the indication of high resistance.

If both readings are low or high, the rectifier should be defective.

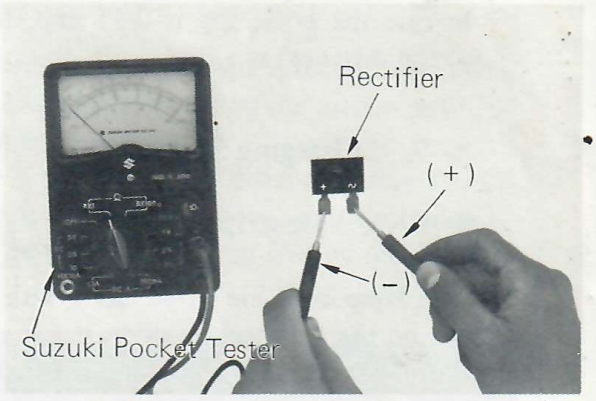


Fig. 8–29 Inverse direction (Current does not flow)

9. FRAME

Exploded view of front fork

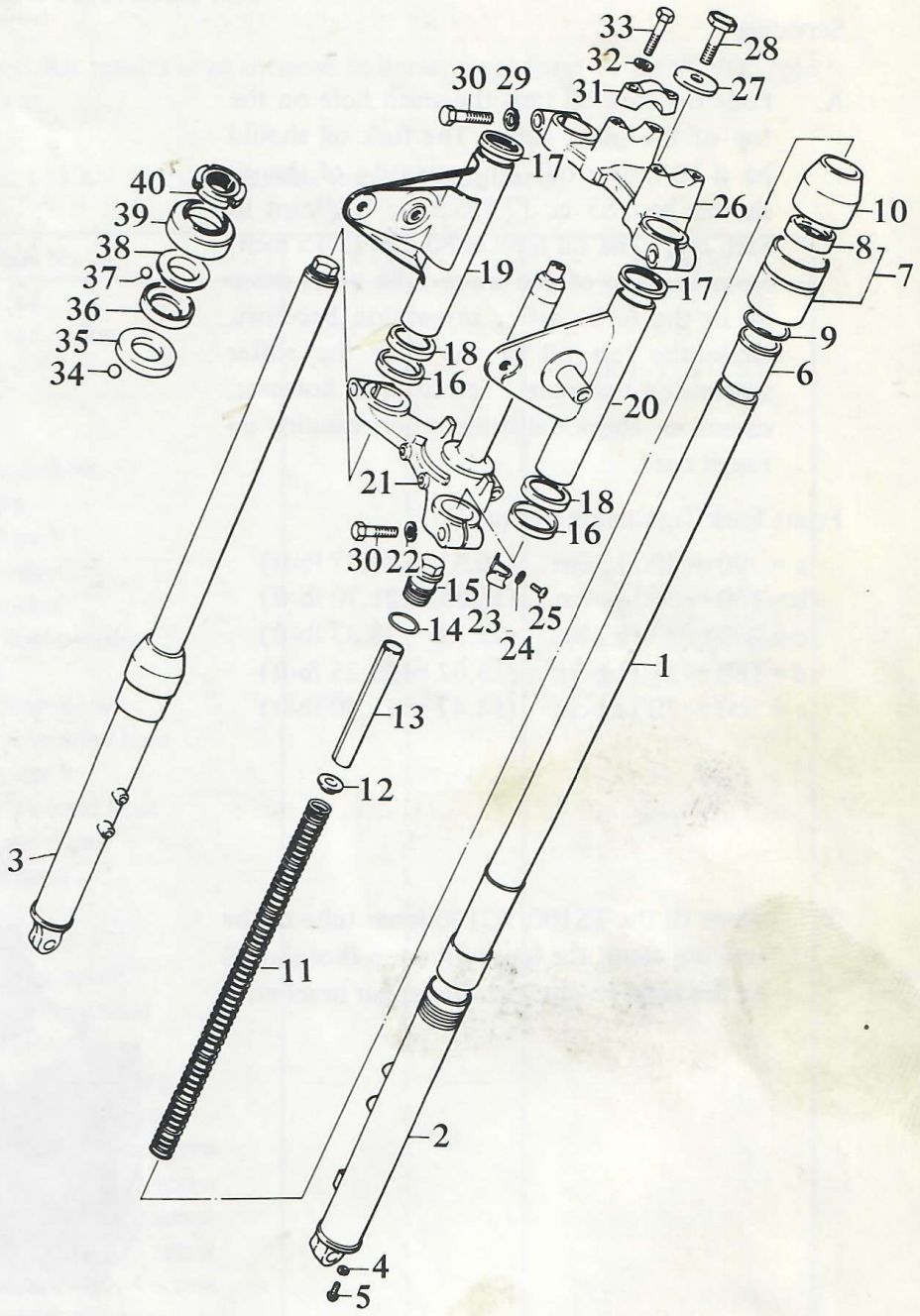


Fig. 9–1 Exploded view of front fork

1. Inner Tube
2. Outer Tube LH
3. Outer Tube RH
4. Drain Plug Gasket
5. Screw
6. Slide Metal
7. Outer Tube Nut
8. Oil Seal
9. Outer Nut O Ring
10. Dust Seal
11. Fork Spring
12. Spring Guide
13. Guide Spacer
14. Inner Tube Cap O Ring
15. Inner Tube Cap
16. Fork Cover Cushion
17. Fork Cover Guide
18. Fork Cover Guide
19. Fork Cover RH
20. Fork Cover LH
21. Steering Stem
22. Lock Washer
23. Brake Cable Clip
24. Lock Washer
25. Screw
26. Steering Stem Head
27. Washer
28. Bolt
29. Lock Washer
30. Inner Tube Bolt
31. Handle Holder
32. Lock Washer
33. Bolt
34. Steel Ball
35. Steering Inner Lower Race
36. Steering Inner Upper Race
37. Steel Ball
38. Steering Outer Upper Race
39. Steering Upper Dust Seal
40. Steering Stem Nut

9–1. Front Fork

Servicing

A. Pour the fork oil into the small hole on the top of the inner tube. The fork oil should be #30 motor oil. The quantity of the oil should be 185 cc (7.8/6.5 oz US/Imp) to each leg. The oil level is 80 mm (3.15 inch) from the top of the inner tube. The more oil in the fork, stiffer suspension becomes, while the less oil in the fork the softer suspension becomes. Too little oil however, causes an abnormal noise when running on rough road.

Front Fork Tightening Torque

a =	90 ~ 200 kg-cm	(6.51 ~ 14.47 lb-ft)
b =	150 ~ 300 kg-cm	(10.85 ~ 21.70 lb-ft)
c =	350 ~ 530 kg-cm	(25.32 ~ 38.33 lb-ft)
d =	180 ~ 280 kg-cm	(13.02 ~ 20.25 lb-ft)
e =	200 ~ 300 kg-cm	(14.47 ~ 21.70 lb-ft)

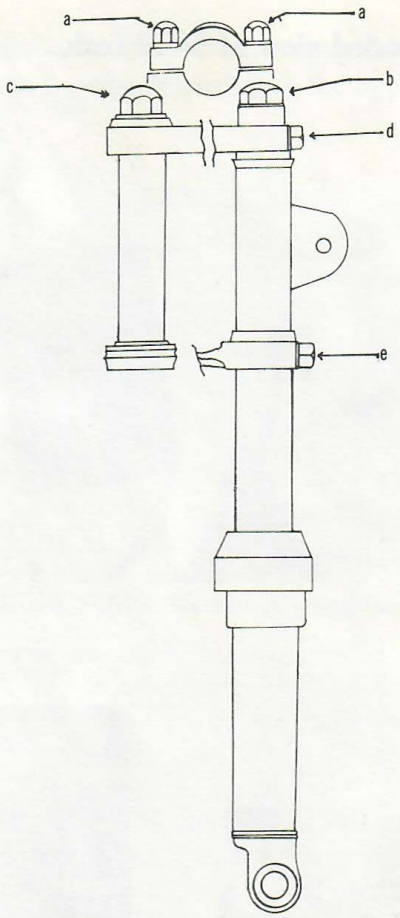


Fig. 9–1–1 Points to be tightened

B. When fit the TS100/TC100 inner tube to the steering stem, the inner tube top face should be the same height with the upper bracket.

Fig. 9–1–2 Fitting inner tube to the steering stem

02935180000

10. INSTALLATION OF TS100 MOTO-CROSS KIT

INSTALLATION OF TS100 MOTOCROSS KIT

Installation of the TS100 Motocross Kit results in an increase in horsepower from 11 hp @7,000 rpm to approximately 17 hp @10,000 rpm.

The TS100 Motorcross Kit (Pat No. 11100–25840) contains the following parts.

Part No.	Part Name	Q'ty	Remarks
11111–25730	Cylinder head	1	
11141–25710	Cylinder head gasket	1	
09482–00075	Spark plug	1	NGK B-8EV
11210–25730	Cylinder	1	
12110–25711	Piston	1	
09329–10008	Carburetor cushion	1	
12410–25700	Rotary valve	1	
13200–25720	Carburetor ass'y	1	
27511–08700	Engine sprocket	1	NT=12
27511–20700	Engine sprocket	1	NT=14
09167–20009	Engine sprocket washer	1	For NT=12 sprocket
12141–25700	Piston ring	1	
13129–25710	Carburetor insulator	1	
09344–03016	Carburetor overflow hose	1	
13700–25700	Air cleaner Ass'y	1	
13881–25700	Carburetor air inlet hose	1	
09402–70305	Air inlet hose clamp	2	
09462–00033	Air cleaner band	1	
11341–25700	Clutch cover	1	
11421–25700	Carburetor cover	1	
11440–25700	Carburetor top cover	1	
11484–25700	Carburetor cover gasket	1	
04211–09129	Carburetor cover pin	2	
09280–30002	Carburetor inlet "O" ring	1	
02112–06708	Clutch cover No. 3 screw	1	
02111–05087	Magneto inspection cap screw	2	
02111–05558	Carburetor cover No. 1 screw	2	
02112–05308	Carburetor cover No. 2 screw	1	
02111–05257	Carburetor cover No. 3 screw	1	
02112–05168	Carburetor cover No. 4 screw	1	
12450–25700	Crankcase outer valve seat	1	
14154–25700	Exhaust flange	1	
09108–06028	Exhaust stud bolt	2	
09443–11002	Exhaust spring	1	
14310–25720	Muffler 1st body	1	
14770–25740	Muffler support damper	1	
08322–11088	Muffler support washer	1	
01122–08358	Muffler support bolt	1	
08321–21088	Muffler support lock washer	1	
08312–11088	Muffler support nut	1	
14476–28000	Muffler stopper bracket	1	

Part No.	Part Name	Q'ty	Remarks
09321–10002	Muffler stopper cushion	1	
08321–21068	Muffler stopper lock washer	1	
01112–06108	Muffler stopper bolt	1	
09443–14002	Muffler stopper spring	1	
14330–25720	Muffler 2nd body	1	
14771–28600	Muffler connector	1	
09402–31601	Muffler connector clamp	1	
02112–06168	Muffler connector clamp screw	1	
14471–25720	Muffler hanger bracket	1	
09180–10011	Muffler hanger spacer	1	
08322–11108	Muffler hanger washer	1	
08321–21108	Muffler hanger lock washer	1	
01122–10458	Muffler hanger bolt	1	
01122–08207	Muffler rear bolt	1	
08322–11088	Muffler rear washer	1	
08321–21088	Muffler rear lock washer	1	
08312–11088	Muffler rear nut	1	
41283–25700	Muffler boss	1	
41284–25700	Muffler stopper boss	1	

INSTALLATION

10–1. Cylinder

a) Before installation the inside passages of all ports may be polished to obtain a small power increase through maximum gas flow efficiency.

b) Clean up all port edges with a file or emery cloth.

c) Install the kit cylinder using the stock base gasket.

d) Torque the cylinder nuts to 100–150 kg-cm(7.2–11 lb-ft)

10–2. Cylinder Head

a) Install the kit cylinder head using one piece of head gasket supplied in the kit.

b) Torque the cylinder head nuts to 200 – 250 kg-cm (14.5 – 18 lb-ft.)

10–3. Spark Plug

A NGK B-8EV Spark Plug is included in the kit. A B-7EV plug may be used if a hotter plug is desired.

10–4. Piston and Piston Ring

a) The kit piston has only one piston ring to minimize friction. This ring should be installed so that the small stamped letter near the ring gap is facing up toward the top of the piston.

b) After about 30 minutes of moderate operation, remove the cylinder and sand the piston surface and cylinder with #400 emery cloth wherever localized scuffing is evident.

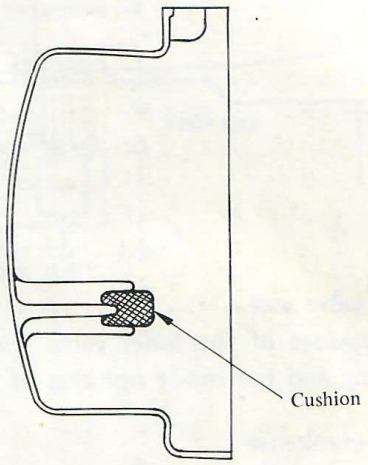
10–5. Carburetor

a) A VM24SC carburetor is supplied with the kit. The standard TS100 carburetor is a VM19SC. Specifications for the kit carburetor are as follows:

Main Jet:	#150	Pilot Jet:	#30
Air Jet:	1.5	Air Screw:	1.0
Jet Needle:	4DH7-1st	Valve Seat:	2.5
Needle Jet:	0–2	Starter Jet:	#50
Cut-away:	#2.5	Fuel Level:	25.75 ± 1 mm

b) For optimum performance under various conditions, carburetor jetting, jet needle positioning and air screw setting may need to be altered.

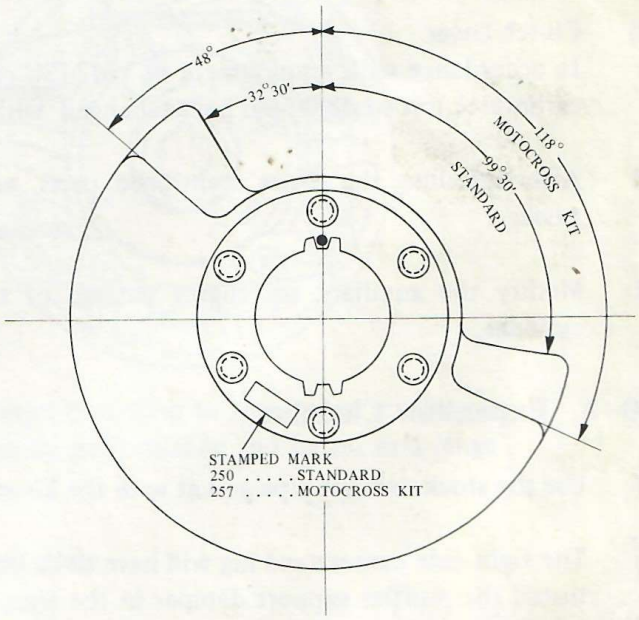
c) Since the carburetor insulator is made of rubber, the carburetor cushion (09329–10008) should be installed on the inside surface of the carburetor inspection cap so that the carburetor cushion touches the float chamber body to prevent the carburetor from coming out.



10–6. Rotary Valve

a) A 166° duration rotary valve is supplied with the kit. The standard rotary valve has a duration of 132°

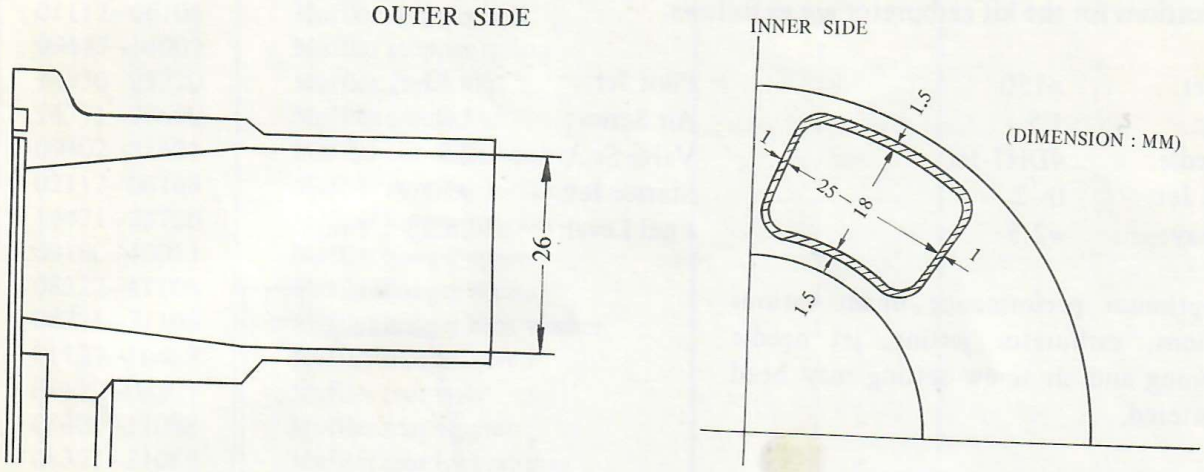
b) Install the rotary disc valve so that the punch mark on the valve hub aligns with the key slot on the crankshaft.



10–7. Porting

Enlargement of the intake passage is necessary to achieve maximum performance through increased fuel-flow efficiency.

a) Outer valve seat
The inner side should be opendd up 1.5 mm (0.04 in) on each side vertically and 1 mm (0.06 in) on each side horizontally.
Particular care should be taken not to damage the fiber surface plate. The CCI oil nozzle in the intake pipe may be filed flush, but make certain the hole is open.



b) Inner valve seat
The passage of the inner valve seat should be opened up to correspond with the crankcase opening and the inside opening of the outer valve seat.

c) Right crankcase
The intake passage of the crankcase does not require further enlargement. The intake passage may be polished for smoother gas flow. Care should be taken not to let metal particles get down inside the crankcase and into the right side crankshaft bearing.

d) Clutch cover
In accordance with employment of VM24SC carburetor, the clutch cover, carburetor cover and carburetor top cover should be exchanged with kit parts.

e) After installing the above mentioned parts, ascertain that no stepping is found on the inlet passage.

f) Modify the auxiliary scavenging passage of the crankcase to match the passage of the kit cylinder.

10–8. Expansion Chamber

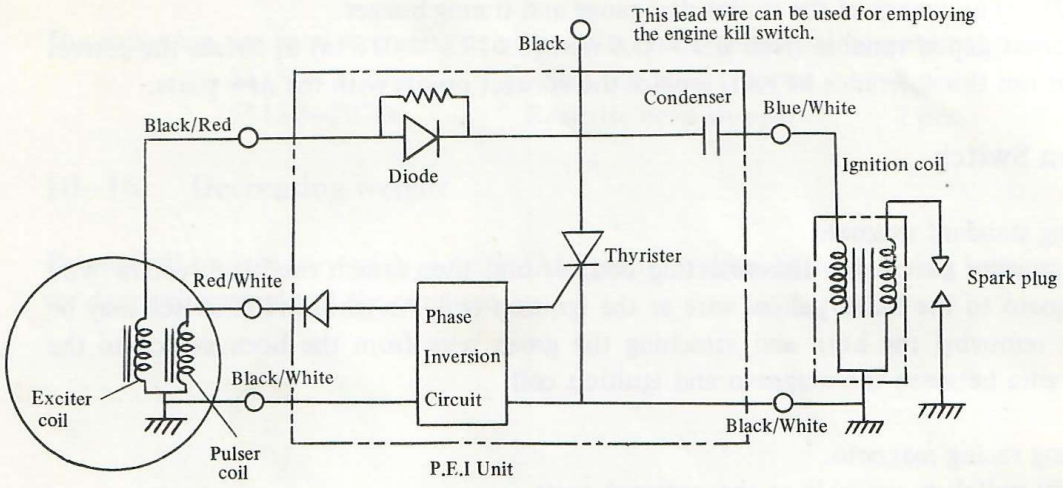
a) Use the stock exhaust pipe gasket with the kit exhaust pipe flange.

b) The right side centerstand lug will have to be cut to allow clearance for the expansion chamber. Install the muffler support damper in the frame hole behind the foot brake lever arm. Do not install it on the torque link arm bolt as this will cuase the expansion chamber to flex when the swinging arm moves.

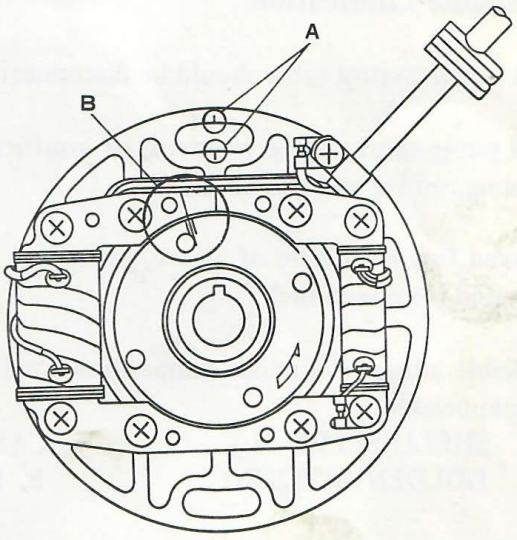
10–9. Inner Rotor Type of P.E.I. System

It is strongly recommended to employ inner rotor type of P.E.I. (Pointless Electronic Ignition) system, which is available as the optional parts.
The inner rotor type of P.E.I. system offers great improvement in mid-range throttle response, together with an excellent sparking performance at any engine revolution.
The system consists of three main parts; namely, the magneto, unit and ignition coil.

– Basic Circuit –



a) When installing the magneto on the engine, set the stator base with mark line (A) on it being in line with the center of the stator fitting screw hole, to obtain the correct ignition timing.
The above adjustment being satisfactory, the ignition timing can also be checked in dynamic state. To inspect the timing, start the engine and keep the engine speed at 6,000 rpm. With a timing light equipped on the Suzuki Electro Tester, check to see if the marking line (B) on the core is in the range of the outside lines on the rotor, which means the ignition timing is 26° B.T.D.C.



The system has been designed to the ignition timing varies according to the engine revolution to meet the engine characteristic and obtain the maximum performance and better mid-range throttle response.

b) Install the P.E.I. UNIT to the frame by using P.E.I. unit plate.

c) Install the ignition coil at the same position as the standard ignition coil, using the ignition coil holder for the stock coil.

d) To prevent disconnection, the couplers, which joins the lead wires of the magento, unit and ignition coil, must be connected soundly.
Tape the lead wires to the frame, since movement of the lead wires could cause loose connection or disconnection while the machine is operated.

e) Use the special tool, Rotor Remover 09930–31610, to take off the rotor.

f) Never use the surface-gap type of spark plug, or the spark plug tends to get fouling and the ignition coil might become faulty in the worst case. The kit spark plug is NGK B-8EV (09482–00075).

10–10. Standard Magneto

a) In case the stock magneto is employed, set the ignition timing at 2.44 – 3.17 mm BTDC (0.095 – 0.125 in) by means of the timing dial gauge and timing buzzer.
The contact point gap is variable from 0.3 – 0.4 mm (0.012 – 0.016 in) to obtain the correct timing. Should not this tolerance be met, replace the contact points with the new parts.

10–11. Ignition Switch

a) In case of using standard magneto
Remove the ignition switch by disconnecting coupler and then attach the black/yellow wire from the magneto to the black/yellow wire at the ignition coil. An ignition kill switch may be fabricated by removing the horn and attaching the green wire from the horn switch to the black yellow wire between the magneto and ignition coil.

b) In case of using racing magneto.
An ignition kill switch is available as the optional parts.

10–12. Engine Lubrication

a) The oil pump control cable should be disconnected.

b) The oil pump must not be removed, or insufficient lubrication to the crankshaft bearings and connecting rod big end will be caused.

c) Use mixed fuel with ratio of 20 : 1, gas to oil. Be sure to supply the same oil into the oil tank as that used for mixed fuel.

d) For reliable lubrication under competition conditions, the following degummed castor base oils are recommended.

SHELL SUPER M	CASTROL R30
GOLDEN SPECTRO	B. P. RACING

e) All oil lines should be bled of air bubbles.
Caution should be used in switching between using mineral base oil and castor base oil. If these oils are mixed without flushing the system with the new oil, gumming may occur.

10–13. Oil Tank

The stock oil tank can be removed and a 130 cc plastic oil bottle installed on the lower rear fender bracket.

44610–17010	Oil Tank
44821–17000	Oil Tank Holder

10–14. Suspensions

a) Front fork . . . . . A heavier grade oil may be used for hard driving to prevent fork bottoming.

b) Rear shock absorber
Optional rear shocks having a 90 mm stroke are available. The standard rear shocks have a 70 mm stroke.

10–15. Tire bead stoppers

The following tire bead stoppers (security bolts) are available as the optional parts.

55150–25700	Front tire bead stopper	1 pc.
55150–20700	Rear tire bead stopper	2 pcs.

10–16. Decreasing weight

Remove all unnecessary parts, such as the lighting system, battery, wiring harness, horn, speedometer for decreasing weight of the machine.

11–2. If Engine Does Not Run Smoothly

Order	Description	Check Points	Action
1.	Turning throttle grip, check to see that engine rpm increases.	* If engine rpm increases, but motorcycle does not run fast:	
		1. Clutch slippage	Adjust or replace clutch plates
		* If engine rpm does not increase:	
		1. Improperly adjusted carburetor	Adjust
		2. Dirty air cleaner	Clean
		3. Clogged fuel line	Clean
		4. Improperly adjusted ignition timing	Adjust
		5. Clogged muffler	Clean
2.	Turning throttle grip, check to see that engine runs smoothly.	* When rapidly accelerated, engine does not run smoothly:	
		1. Improper ignition timing	Adjust
		2. Improperly working contact breaker	Adjust
		3. Improperly adjusted carburetor	Adjust
		4. Dirty spark plug	Clean and Adjust
		* If engine does not run smoothly at low rpm:	
		1. Too early ignition timing	Adjust
		2. Dirty contact point	Clean and adjust
		3. Dirty or improperly adjusted spark plug	Clean and adjust
		4. Improperly adjusted carburetor pilot air adjusting screw	Adjust
		5. Clogged or damaged fuel line	Clean or replace
		6. Improperly working contact breaker	Adjust
		* If engine does not run smoothly at high rpm:	
		1. Clogged fuel tank cap air vent	Clean with a wire
		2. Clogged or damaged fuel line	Clean or replace
		3. Dirty or improperly adjusted spark plug	Clean and adjust
		4. Improperly working contact breaker	Adjust
		5. Too late ignition timing	Adjust
		6. Improperly adjusted carburetor	Adjust
		7. Dirty air cleaner	Clean
3.	Check to see that engine compression is proper.	See "If engine is hard to start" section.	
4.	If engine overheats.	1. Improperly adjusted oil pump control lever clearance	Adjust
		2. Air in oil lines	Remove air
		3. Improper ignition timing	Adjust
		4. Carbon deposit in combustion chamber	Clean
		5. Carbon deposit in exhaust pipe and muffler	Clean
		6. Incorrect spark plug heat range	Replace with colder plug
		7. Low grade oil used	Replace with correct oil
		8. Clutch slippage	Adjust or replace plates
		9. Brake dragging	Adjust
		10. Drive chain too tight	Adjust

11–3. If Abnormal Noise is Heard in Engine

Order	Description	Check Points	Action
		1. Too big clearance between piston and cylinder	Repair or replace
		2. Too big clearance between piston rings and grooves	Replace piston
		3. Piston rings stiff with carbon	Clean
		4. Worn con-rod big end	Replace
		5. Worn con-rod small end bearing	Replace
		6. Damaged piston rings	Replace
		7. Too early ignition timing	Adjust
		8. Defective primary pinion and gear	Replace
		9. Worn crankshaft bearings	Replace
		10. Defective transmission gears	Replace
		11. Defective transmission shaft bearings	Replace

11–4. If Engine Overheats

If engine overheats at high speed running after it is broken in, check to see if the oiling system is in good condition, the brake is dragging, or cylinder cooling fins are dirty. Inspect the following points.

Order	Description	Check Points	Action
1.	Check to see if oiling system is in good condition.	1. Improperly adjusted oil pump control lever	Adjust
		2. Air in oil lines	Remove air
		3. Choked oil tank breather pipe	Correct
		4. Incorrect oil used	Use prescribed oils
2.	Check to see if engine compression is higher than standard	* Too high compression	
		1. Carbon deposits in combustion chamber	Remove carbon deposits
		2. Too thin cylinder head gasket	Replace
3.	Check carbon deposits	* Check for carbon deposits in muffler, exhaust pipe, exhaust port and combustion chamber	Disassemble and remove carbon deposits
4.	Check to see that piston rings move smoothly in grooves	* Piston rings stiff from carbon deposits	Remove carbon deposits
5.	Check to see that the clutch works properly	* Clutch slippage causes overheating of engine	Adjust or replace plates
6.	Check to see that the ignition timing is correct		Adjust
7.	Drive chain too tight		Adjust
8.	Incorrect spark plug heat range		Replace with colder plug
9.	Too lean fuel mixture		Adjust carburetor

11–2. If Engine Does Not Run Smoothly

Order	Description	Check Points	Action
1.	Turning throttle grip, check to see that engine rpm increases.	* If engine rpm increases, but motorcycle does not run fast:	
		1. Clutch slippage	Adjust or replace clutch plates
		* If engine rpm does not increase:	
		1. Improperly adjusted carburetor	Adjust
		2. Dirty air cleaner	Clean
		3. Clogged fuel line	Clean
		4. Improperly adjusted ignition timing	Adjust
		5. Clogged muffler	Clean
2.	Turning throttle grip, check to see that engine runs smoothly.	* When rapidly accelerated, engine does not run smoothly:	
		1. Improper ignition timing	Adjust
		2. Improperly working contact breaker	Adjust
		3. Improperly adjusted carburetor	Adjust
		4. Dirty spark plug	Clean and Adjust
		* If engine does not run smoothly at low rpm:	
		1. Too early ignition timing	Adjust
		2. Dirty contact point	Clean and adjust
		3. Dirty or improperly adjusted spark plug	Clean and adjust
		4. Improperly adjusted carburetor pilot air adjusting screw	Adjust
		5. Clogged or damaged fuel line	Clean or replace
		6. Improperly working contact breaker	Adjust
		* If engine does not run smoothly at high rpm:	
		1. Clogged fuel tank cap air vent	Clean with a wire
		2. Clogged or damaged fuel line	Clean or replace
		3. Dirty or improperly adjusted spark plug	Clean and adjust
		4. Improperly working contact breaker	Adjust
		5. Too late ignition timing	Adjust
		6. Improperly adjusted carburetor	Adjust
		7. Dirty air cleaner	Clean
3.	Check to see that engine compression is proper.	See "If engine is hard to start" section.	
4.	If engine overheats.	1. Improperly adjusted oil pump control lever clearance	Adjust
		2. Air in oil lines	Remove air
		3. Improper ignition timing	Adjust
		4. Carbon deposit in combustion chamber	Clean
		5. Carbon deposit in exhaust pipe and muffler	Clean
		6. Incorrect spark plug heat range	Replace with colder plug
		7. Low grade oil used	Replace with correct oil
		8. Clutch slippage	Adjust or replace plates
		9. Brake dragging	Adjust
		10. Drive chain too tight	Adjust

11–3. If Abnormal Noise is Heard in Engine

Order	Description	Check Points	Action
		1. Too big clearance between piston and cylinder	Repair or replace
		2. Too big clearance between piston rings and grooves	Replace piston
		3. Piston rings stiff with carbon	Clean
		4. Worn con-rod big end	Replace
		5. Worn con-rod small end bearing	Replace
		6. Damaged piston rings	Replace
		7. Too early ignition timing	Adjust
		8. Defective primary pinion and gear	Replace
		9. Worn crankshaft bearings	Replace
		10. Defective transmission gears	Replace
		11. Defective transmission shaft bearings	Replace

11–4. If Engine Overheats

If engine overheats at high speed running after it is broken in, check to see if the oiling system is in good condition, the brake is dragging, or cylinder cooling fins are dirty. Inspect the following points.

Order	Description	Check Points	Action
1.	Check to see if oiling system is in good condition.	1. Improperly adjusted oil pump control lever	Adjust
		2. Air in oil lines	Remove air
		3. Choked oil tank breather pipe	Correct
		4. Incorrect oil used	Use prescribed oils
2.	Check to see if engine compression is higher than standard	* Too high compression	
		1. Carbon deposits in combustion chamber	Remove carbon deposits
		2. Too thin cylinder head gasket	Replace
3.	Check carbon deposits	* Check for carbon deposits in muffler, exhaust pipe, exhaust port and combustion chamber	Disassemble and remove carbon deposits
4.	Check to see that piston rings move smoothly in grooves	* Piston rings stiff from carbon deposits	Remove carbon deposits
5.	Check to see that the clutch works properly	* Clutch slippage causes overheating of engine	Adjust or replace plates
6.	Check to see that the ignition timing is correct		Adjust
7.	Drive chain too tight		Adjust
8.	Incorrect spark plug heat range		Replace with colder plug
9.	Too lean fuel mixture		Adjust carburetor

11–5. If Engine Stops Abruptly During Running

If engine stops during running, first check to see if there is fuel in tank, wiring harnesses are connected etc. and inspect the following points.

Order	Description	Check Points	Action
1.	If engine stops abruptly.	1. Seized piston	Repair or replace
		2. Seized Crankshaft	Repair or replace
		3. Seized transmission gears	Repair or replace
		4. Spark plug bridged	Clean
		5. Defective ignition coil	Replace
		6. Troubles in ignition system	Repair or replace
		7. Clogged fuel line	Clean
2.	If engine stops gradually	1. Loose spark plug	Tighten securely
		2. Loose cylinder head	Tighten securely
		3. Damaged cylinder head gasket	Replace
		4. Clogged fuel line	Clean

11–6. Defective Brakes

First check the play in the front brake lever and the rear brake pedal. Inspect the following points.

Order	Description	Check Points	Action
1.	Insufficient braking	1. Worn brake linings	Replace
		2. Dirty brake linings	Clean
		3. Brake drum worn or dirty with mud or water	Replace or clean
		4. Worn brake cam	Replace
		5. Improperly working front brake wire	Adjust or replace
2.	Brake drags	1. Rust in moving parts	Repair
		2. Moving parts dirty with oil or insufficient lubricant	Clean and apply a proper amount of lubricant
3.	Abnormal noises are heard	1. Worn brake linings	Replace
		2. Foreign particles on brake linings	Clean
		3. Dirty brake drum	Clean

11–7. Defective Clutch

Order	Description	Check Points	Action
1.	Clutch slippage	1. Improperly adjusted clutch	Adjust
		2. Worn clutch springs	Replace
		3. Worn clutch plates	Replace
2.	If clutch drags	1. Improper weight oil	Replace
		2. Uneven clutch spring tension	Replace
		3. Defective clutch plate operation	Repair or replace

11–8. Gear Shifting Troubles

First check the clutch operation and amount of oil in the transmission chamber. Inspect the following points.

Order	Description	Check Points	Action
1.	Gear engagement	* If gears do not engage, check for:	
		1. Damaged cam groove	Replace change cam
		2. Shifting forks not moved smoothly on cam	Repair scoring or burrs
		3. Damaged gear shifting fork	Replace
		4. Seized gears	Replace
2.	Gear shifting lever	* If gear shifting lever does not return to normal position, check for:	
		1. Damaged gear shifting shaft return spring	Replace
		2. Friction between gear shifting shaft and crankcase	Repair bent shaft or replace
3.	Jumping out of gear	* If the gears disengage while running, check for:	
		1. Worn or bent gear shifting fork	Replace
		2. Worn gear dog teeth	Replace
		3. Worn or damaged gear shifting cam stopper spring	Replace gear

11–9. Bad Stabilization and Steering

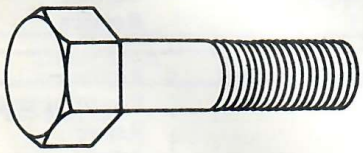
Order	Description	Check Points	Action
1.	Handlebar stiff	1. Steering stem lock nut too tight	Adjust
		2. Bent steering stem	Repair or replace
		3. Damaged steel balls	Replace
2.	Handlebar not stable	1. Incorrect wheel alignment	Adjust
		2. Play in front wheel fitting	Repair
		3. Damaged steel balls	Replace
		4. Bent fork stem	Repair or replace
		5. Worn or damaged bearing races	Replace
		6. Bent front fork	Repair or replace
		7. Bent swinging arm	Repair
		8. Incorrect fork oil level	Correct
		9. Worn fork spring	Replace
3.	Wheel is not true	1. Up-and-down play in hub bearings	Replace
		2. Deformed wheel rim	Repair or replace
		3. Loose spokes	Repair
		4. Chain too tight	Adjust
		5. Loose swinging arm fitting	Tighten
		6. Warped frame	Replace
		7. Incorrect tire pressure	Correct

12. TIGHTENING TORQUE OF IMPORTANT PARTS

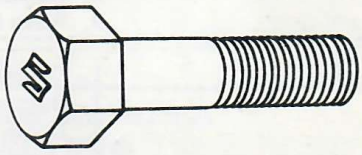
Part		kg-cm	lb-ft
Front Axle Nut	12	360 ~ 520	26.0 ~ 37.5
Front Fork Upper Bracket Bolt	10	200 ~ 300	14.5 ~ 21.7
Front Fork Lower Bracket Bolt	10	200 ~ 300	14.5 ~ 21.7
Steering Stem Nut (relative torque)	24	600 ~ 1,000	43.3 ~ 72.3
Handle Set Bolt	8	120 ~ 200	8.7 ~ 14.5
Front Footrest Bolt	8	100 ~ 150	7.2 ~ 10.8
Rear Axle Nut	12	360 ~ 520	26.0 ~ 37.5
Rear Sprocket Mounting Shaft Nut	18	550 ~ 700	39.7 ~ 50.5
Rear Swinging Arm Pivot Shaft Nut	10	200 ~ 300	14.5 ~ 21.7
Rear Torque Link Nut	8	100 ~ 150	7.2 ~ 10.8
Rear Shock Absorber Nut	10	200 ~ 300	14.5 ~ 21.7
Brake Cam Lever Nut	6	50 ~ 80	3.6 ~ 5.8

Tightening torque for general bolts

Bolt diameter (mm)	Tightening torque			
	Usual bolt		"S" marked bolt	
	Kg-cm	lb-ft	Kg-cm	lb-ft
5	20–40	1.5–2.9	30–60	2.2–4.4
6	40–70	2.9–5.1	60–100	4.4–7.3
8	90–140	6.6–10	130–230	9.5–17
10	180–280	13–20	250–400	18–29



USUAL BOLT



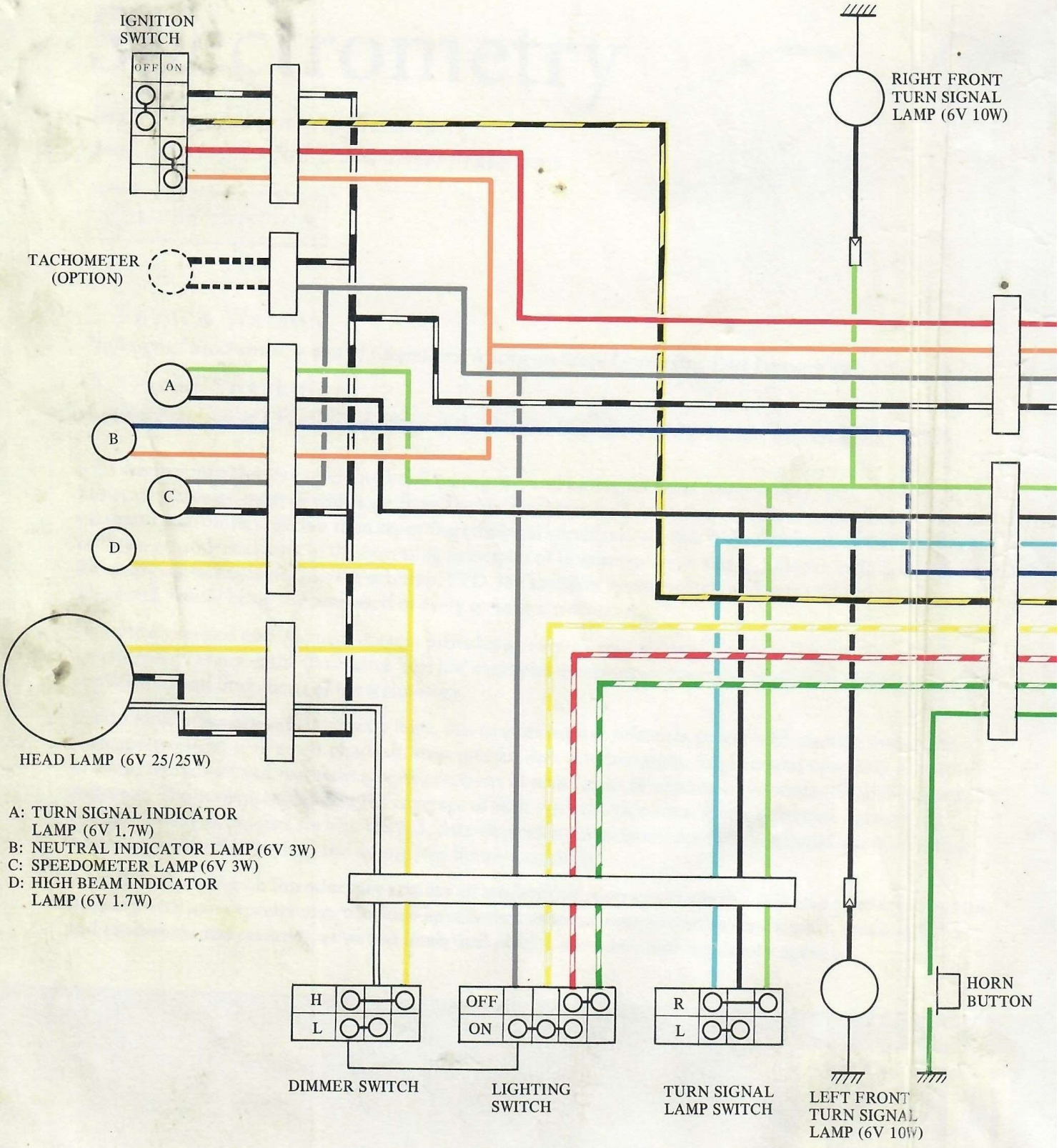
"S" MARKED BOLT

PERIODIC INSPECTION CHART

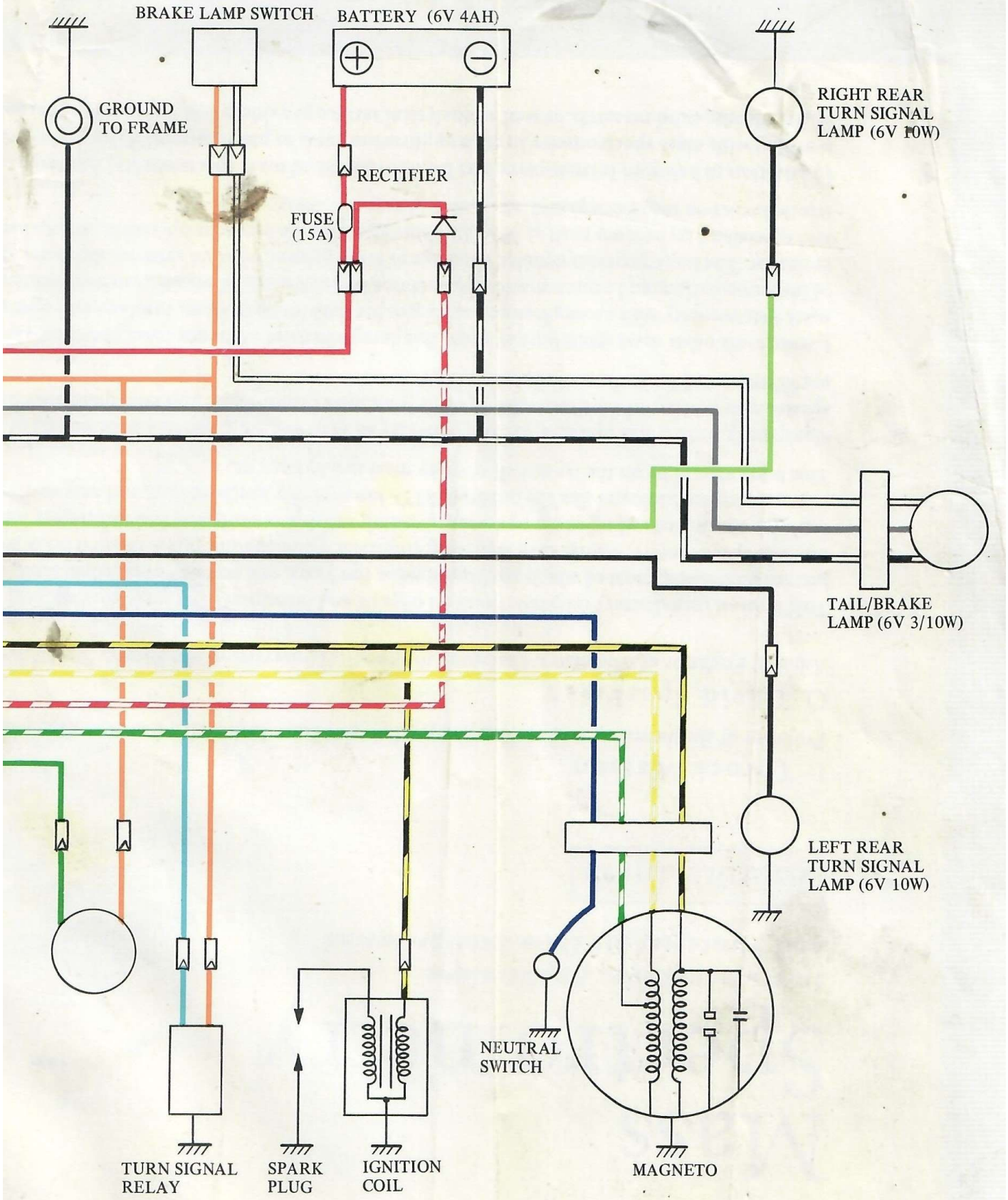
The chart below indicates time when inspections, adjustments and maintenance are required based on the distance the motorcycle runs, that is first 1,000km (750 mi), and every 3,000km (2,000 mi), 6,000km (4,000 mi) and 12,000km (8,000 mi) thereafter. According to the chart, advise users to make the motorcycle checked and serviced at your shop.
See the appropriate section for instructions on making the inspection.

Distance (km)	1,000 km	Every 3,000 km	Every 6,000 km	Every 12,000 km
	750 mi	Every 2,000 mi	Every 4,000 mi	Every 8,000 mi
Oil pump	Check operation, adjust control lever adjusting marks	Check operation, adjust control lever adjusting marks		
Spark plug	Clean	Clean and adjust gap	Replace	
Gearbox oil	Change	Change		
Throttle, Brake and Clutch cables	Adjust play	Adjust play	Lubricate	
Carburetor	Adjust with throttle valve screw and pilot air screw	Adjust with throttle valve screw and pilot air screw		Overhaul and clean
Magneto	Check contact point gap and ignition timing. Retighten magneto nut	Check contact point gap and ignition timing. Lubricate contact breaker cam oil felt		Replace contact point
Cylinder head and Cylinder	Retighten cylinder and cylinder head nuts	Retighten cylinder and cylinder head nuts	Remove carbon	
Battery	Check and service electrolyte solution	Check and service electrolyte solution		
Fuel cock	Clean fuel strainer		Clean fuel strainer	
Drive chain	Adjust	Adjust and lubricate	Wash	
Brakes	Adjust play	Adjust play		
Air cleaner		Clean		
Throttle grip			Put grease in throttle grip	
Muffler	Retighten exhaust fitting nuts	Retighten exhaust fitting nuts	Remove carbon	
Steering stem	Check play Retighten stem nuts		Check play Retighten stem nuts	
Bolts, Nuts and Spokes	Retighten		Retighten	
Oil outlet			Clean outlet union filter	

TS100 & TC100 WIRING DIAGRAM (ST



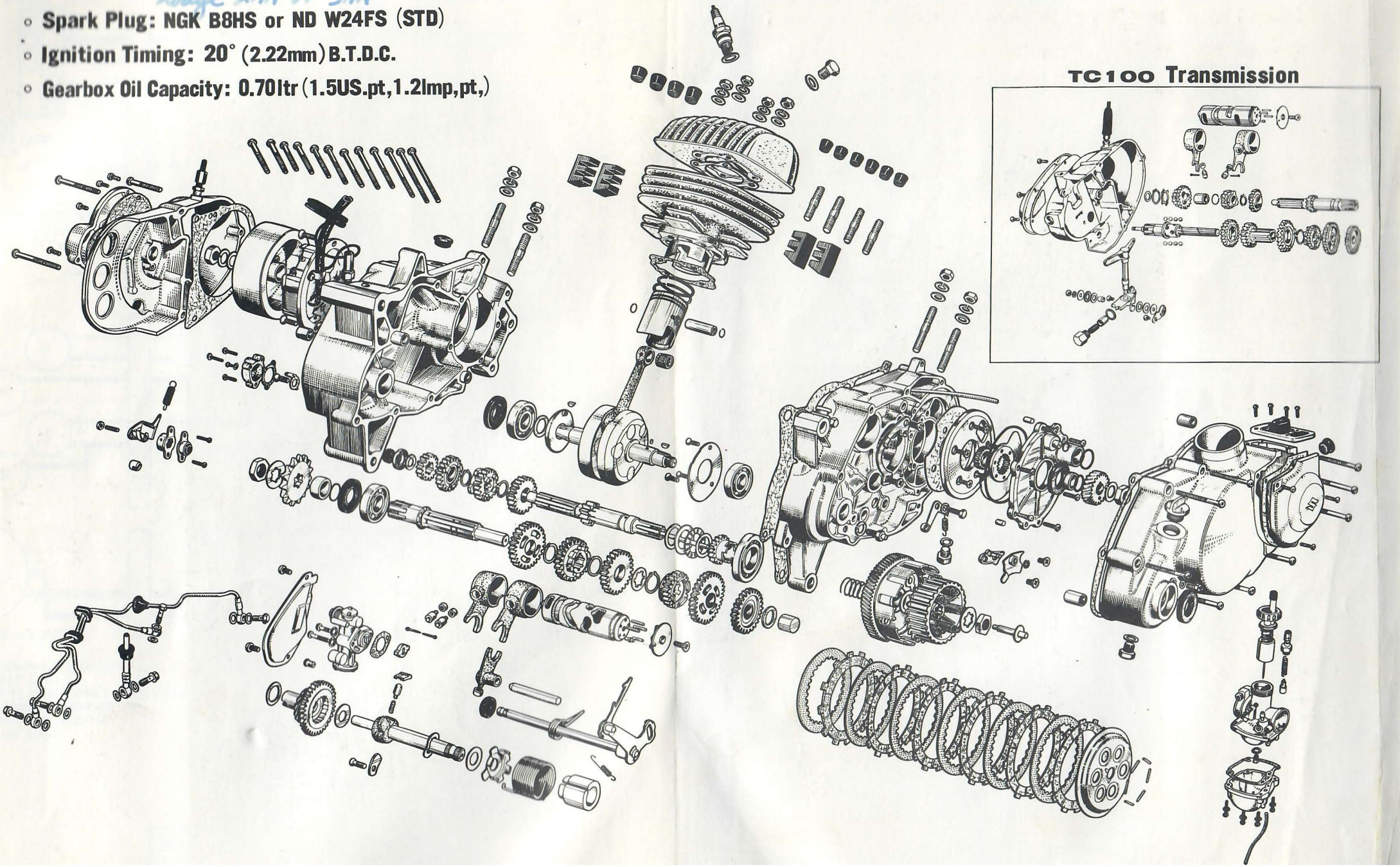
TANDARD SPECIFICATION)



AC MC14IF or S41F
Champion L78 or L5
KLG F80
Lodge 2HN or 3HN

SUZUKI TS/TC100 ENGINE

- Spark Plug: NGK B8HS or ND W24FS (STD)
- Ignition Timing: 20° (2.22mm) B.T.D.C.
- Gearbox Oil Capacity: 0.70ltr (1.5US.pt, 1.2Imp.pt,)



TC100 Transmission

SUZUKI

SUZUKI MOTOR CO.,LTD.